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The University of Iowa General Catalog 1990-92

University of Iowa

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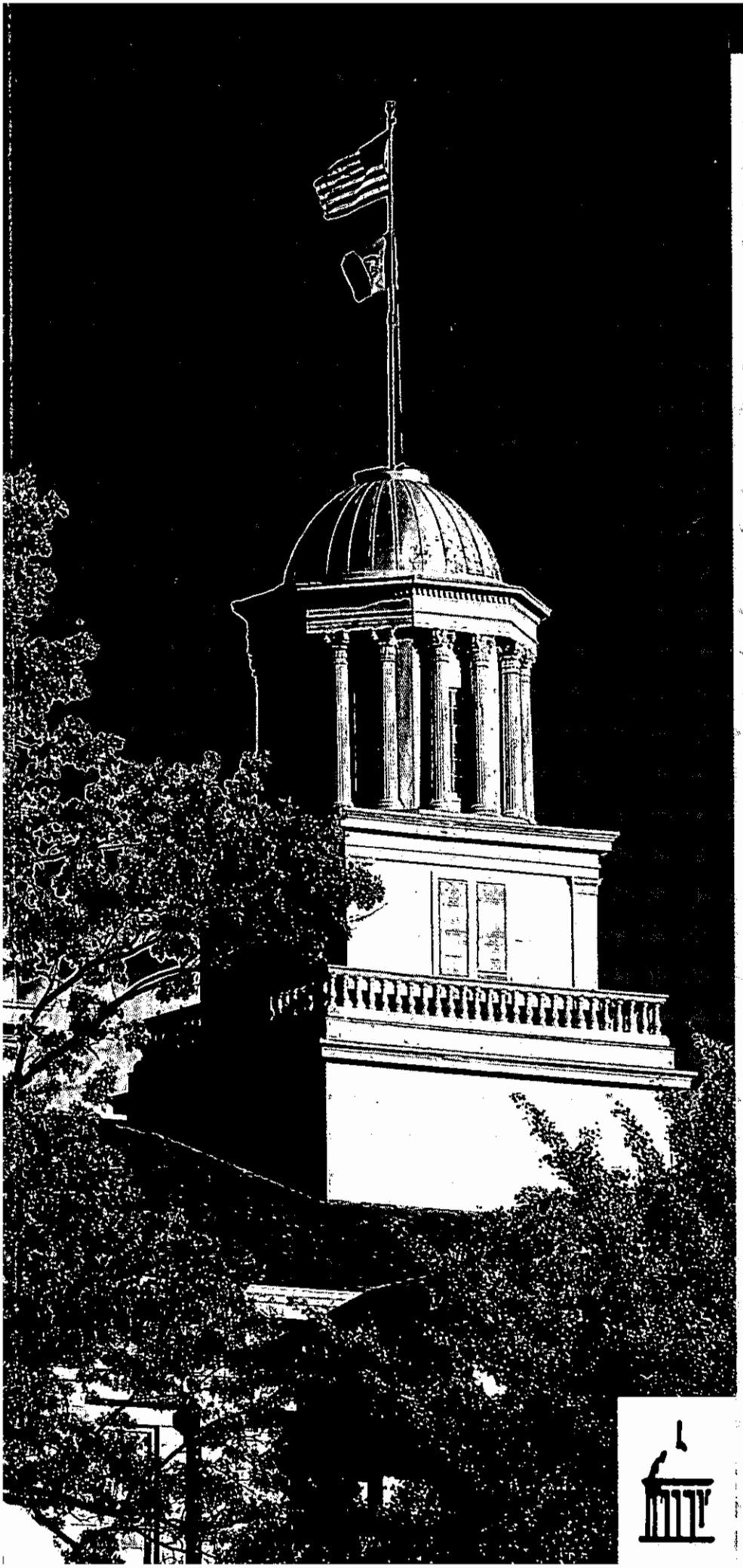


THE UNIVERSITY OF IOWA

GENERAL CATALOG

1990-1992

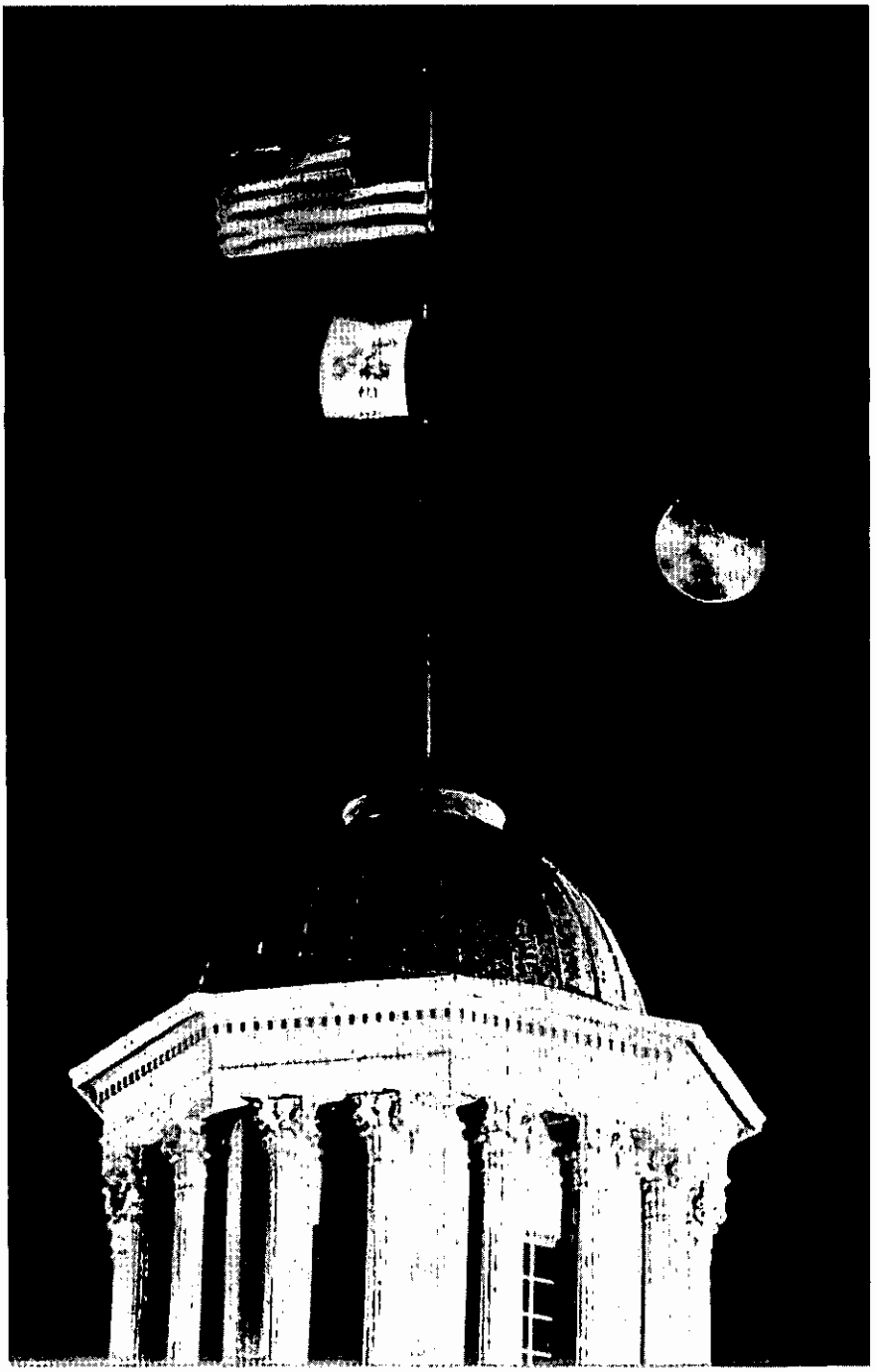
THE UNIVERSITY OF IOWA
Iowa City, Iowa 52242

GENERAL CATALOG

1990-1992

Produced by University Relations
and the Office of the Registrar

The University of Iowa General Catalog 1990-92



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Copies of the *General Catalog* are available for examination in Iowa high schools, offices of the county superintendents of schools, public libraries, and junior and community colleges; at the major state government offices in Des Moines; and in each office of the University. Copies may be requested from the bookstore at the Iowa Memorial Union at a cost of $3. Reprints of individual sections of the *Catalog* are available free of charge.

The *General Catalog* is published for informational purposes and should not be construed as the basis of a contract between a student and The University of Iowa. Every effort is made to provide information that is accurate at the time the *Catalog* is prepared. However, information on regulations, policies, fees, curricula, courses, and other matters is subject to change any time during the period for which the *Catalog* is in effect.

Current information regarding fees, important dates, and the availability of courses can be found in the *Schedule of Courses,* which is available before each term begins. The publications *This Is Iowa* and *The Graduate Experience* also include information on admission, fees, scholarships, student financial aid, housing, and student personnel services.

The University of Iowa does not discriminate in its educational programs and activities on the basis of race, national origin, color, religion, sex, age, or disability. The University also affirms its commitment to providing equal opportunities and equal access to University facilities without reference to affectional or associational preference. For additional information on nondiscrimination policies, contact the Coordinator of Title IX and Section 504 in the Office of Affirmative Action, telephone 319-335-0705, 202 Jessup Hall, The University of Iowa, Iowa City, Iowa 52242.

University Calendar

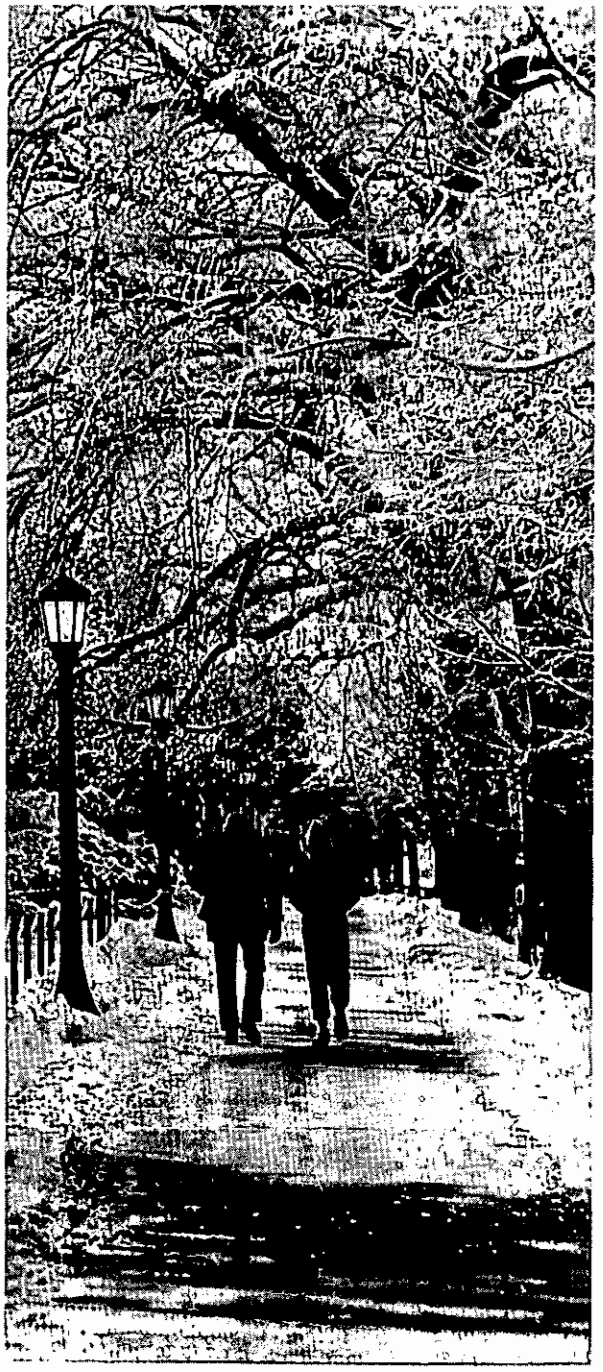
Fall Semester	1990	1991
Registration begins	August 20	August 26
Classes begin	August 22	August 28
University holiday	September 3	September 2
Homecoming	October 19	October 24
Thanksgiving recess begins	November 20	November 26
University holidays	November 22-23	November 28-29
Classes resume	November 26	December 2
Classes end	December 7	December 13
Examination week	December 10-14	December 16-20
Commencement ceremonies	December 14-15	December 20-21
University holidays	December 24-25	December 24-25

Spring Semester	1991	1992
University holiday	January 1	January 1
Registration begins	January 14	January 20
Classes begin	January 15	January 21
Foundation day	February 25	February 25
Spring vacation begins	March 15	March 20
Saturday classes only meet	March 16	March 21
Classes resume	March 25	March 30
Classes end	May 3	May 8
Examination week	May 6-10	May 11-15
Commencement ceremonies	May 10-11	May 15-16
University holiday	May 27	May 25

Summer Session	1991	1992
Registration	June 10	June 15
Classes begin	June 11	June 16
University holiday	July 4	July 3
Classes end	August 2	August 7
Commencement ceremonies	August 2	August 7
Independent study unit for law, graduate students	August 5-23	August 3-21

Campus Visits

The best introduction to The University of Iowa is a visit to the campus. Come first to the John G. Bowman House Admissions Visitors Center, located at 230 N. Clinton. Office hours: Weekdays 8:30 a.m. to 4:30 p.m., Saturdays 9-11 a.m. It is best to visit the campus on weekdays, when classes are in session and when other University offices are open. Please call to arrange for a campus visit. Toll-free 1-800-553-4692, nationwide. Direct dial: 319-335-3847.



Contents

What Iowa Is All About

The University of Iowa is a major national research university with a solid liberal arts foundation. Responsible for many historic firsts, it has won international recognition for its wealth of achievement in the arts, sciences, and humanities.

Founded in 1847 as Iowa's first public institution of higher education, the University brings together undergraduate, graduate, and professional students with distinguished teachers and scholars in a close-knit, intellectual community.

The University was the first U.S. public university to admit men and women on an equal basis and the first institution of higher education in the nation to accept creative work in theater, writing, music, and art as theses for advanced degrees. It established the first law school west of the Mississippi, broadcast the world's first educational television programs, and developed and continues to hold preeminence in educational testing. It also operates the nation's largest university-owned teaching hospital.

The home of pioneering space research, Iowa has designed and built research instruments carried aboard many major U.S. space missions, including the Galileo spacecraft currently on a six-year journey to Jupiter. Its research in hydraulics engineering is world renowned, as are its innovations in biomedical engineering, agricultural medicine, and pharmacology education.

A member of the select Association of American Universities, an organization of institutions recognized for excellence in research, The University of Iowa maintains a balance between scholarly research and teaching. Both are enhanced by Iowa's many centers and institutes and the University Libraries, one of the largest research library systems in the country.

Liberal Arts at Iowa: Education for Life

A program of study in the liberal arts is considered "education for life" at The University of Iowa. The College of Liberal Arts has the largest enrollment among the University's ten colleges and is the entering point for most students, including those who later transfer into one of the eight professional colleges.

Professional education is provided through the Colleges of Business Administration, Dentistry, Education, Engineering, Law, Medicine, Nursing, and Pharmacy. The Graduate College provides leadership in development, review, and oversight of graduate programs.

The University of Iowa has a diverse and distinguished faculty, whose members bring outstanding backgrounds in research and education to their teaching assignments. Many have been recognized for their outstanding accomplishments with awards including Guggenheim Fellowships, senior fellowships from the National Endowment for the Humanities, and Fulbright scholarships for teaching and study abroad. Three are Howard Hughes Medical Institute (HHMI) investigators—one each in biochemistry, internal medicine, and physiology and biophysics.

The University reaches out to all segments of society. It seeks students who are high achievers, yet at the same time it serves a broad cross-section of students. Approximately 29,000 students enroll at Iowa each fall and spring semester. Nearly 70 percent come from Iowa, 18 percent from adjoining states, and 6.5 percent from the remaining states. Foreign students from 90 foreign countries make up 5.5 percent of the University's enrollment.

Wealth and Diversity of Programs, Services

The University's Iowa Center for the Arts provides the stimulus and setting for professional-caliber theater, dance, and musical performances by students and faculty as well as by visiting artists from around the world. The Museum of Art displays outstanding permanent collections, works by faculty and students, and traveling exhibits year around, and the world-renowned Writers' Workshop and International Writing Program help make the University and Iowa City one of the nation's most prominent arts communities.

As the nation's largest university-owned teaching hospital, The University of Iowa Hospitals and Clinics serves more than 450,000 persons from Iowa and other states every year. Specialized care is provided by more than 1,400 physicians and dentists, 1,500 registered nurses, and 4,300 professional and support staff. Teams of faculty, clinical support specialists, and students study and learn as they care for patients. University Hospitals and Clinics keeps in close touch with community hospitals and health professionals throughout the state, continually sharing new knowledge with them.

In athletics, the Iowa Hawkeyes enjoy national recognition and enduring fan loyalty as leaders in football, basketball, wrestling, field hockey, swimming, and gymnastics. A member of the Big Ten athletic conference, Iowa offers ten intercollegiate sports for women and ten for men.

The University's 900-acre campus includes more than 100 major buildings, most within walking distance from each other and all fully accessible to persons with disabilities.

Overlooking the Iowa River is Old Capitol, the central landmark of the campus. Built in Greek revival style during the early 1840s, Old Capitol served as the last capitol building for Iowa's territorial government from 1842 until 1846, and then housed the legislature and government offices for the state of Iowa until 1857, when state government moved to Des Moines. Various University offices and departments were housed in the building until it was restored as a National Historic Landmark and opened to the public in 1976.

A major attraction and educational facility at the University is Iowa Hall, a 6,000-square-foot gallery in the Museum of Natural History in Macbride Hall that presents life-like exhibits of scenes from Iowa's four billion years of natural history. The museum itself houses more than one million specimens of plant and animal life.

In addition to the Iowa City campus, there are University research and field study facilities at nearby Oakdale, at the Macbride Nature Recreation Area north of Iowa City, and at the Lakeside Laboratory on Lake Okoboji in northwest Iowa.

Iowa City

A forward-looking community provides a special setting for The University of Iowa. Iowa City is casual and cosmopolitan, a meeting place for scholars, artists, and scientists. The relationship between Iowa City and the University is friendly, cooperative, and supportive. Faculty and staff share the responsibilities of community government and service with people outside the University. Together they create an environment for growth in learning and business, in health and social well-being.

A community of some 51,000 people, Iowa City lies within 300 miles of Chicago, Minneapolis, and St. Louis. The city is accessible by airlines serving the Cedar Rapids-Iowa City airport, by major bus lines, and by car from major highways.

Learning at Iowa

ACADEMIC PROGRAMS

The University of Iowa is one of Iowa's three state universities. With Iowa State University and the University of Northern Iowa, it is governed by the State Board of Regents.

The College of Liberal Arts is the core of the University, with six schools and more than 50 departments and programs. It is closely linked with the professional colleges of Business Administration, Dentistry, Education, Engineering, Law, Medicine, Nursing, and Pharmacy, and with the Graduate College. All ten colleges are located on the Iowa City campus.

The University faculty includes some 1,600 full-time members, many of whom have established national and international reputations. Their effectiveness as teachers is enhanced by their involvement in scholarly and scientific research. Some faculty members from the University's professional colleges also teach undergraduate classes including a number of interdisciplinary courses, in the College of Liberal Arts.

The University's undergraduate student enrollment is about evenly divided between men and women. Approximately three out of four undergraduates are Iowa residents. The rest are students from the other 49 states and more than 65 foreign countries.

About 73 percent of the University's entering freshmen had a B average or above in high school. Approximately 91 percent ranked in the upper half of their high school classes and about 24 percent ranked in the upper tenth.

The University of Iowa offers a comprehensive program of student financial aid. Half of the University's students have some form of employment; one-third have education loans; one of ten undergraduates and one of five freshmen have scholarships. Most UI scholarships are awarded on the basis of demonstrated financial need and academic excellence, with a small number of grants awarded solely for scholarly achievement.

Reflecting a growing trend toward lifelong learning, the University in recent years has expanded educational programs substantially, both on and off campus, for individuals who cannot enroll as regular full-time students. These learning opportunities include minicourses, conferences, workshops, continuing education programs for professionals, Saturday and evening classes offered on campus, and credit courses taught off campus. In 1977 the University, in cooperation with Iowa's other two state universities, introduced a new Bachelor of Liberal Studies (B.L.S.) degree program designed for adults who want to earn a college degree but are unable to enroll in traditional on-campus study.

Degrees Offered

The University offers the following degrees. The major fields are listed in the various college sections of the *Catalog*.

Bachelor of Arts, Bachelor of Science, Bachelor of Music, Bachelor of Fine Arts, Bachelor of General Studies, Bachelor of Liberal Studies, Bachelor of Business Administration, Bachelor of Science in Engineering, Bachelor of Science in Pharmacy, Bachelor of Science in Nursing, Bachelor of Science in Medicine, Doctor of Dental Surgery, Juris Doctor, Master of Comparative Law, Doctor of Medicine, Master of Arts, Master of Science, Master of Business Administration, Master of Fine Arts, Master of Social Work, Master of Physical Therapy, Master of Arts in Teaching, Education Specialist, Doctor of Musical Arts, Doctor of Pharmacy, and Doctor of Philosophy.

Accreditation and Associations

The University of Iowa has been accredited by the North Central Association of Colleges and Secondary Schools since the association's organization in 1913. The University is a member of the Association of American Universities and is associated with Northwestern, Indiana, Purdue, Ohio State, and Michigan State universities and the Universities of Illinois, Minnesota, Wisconsin, and Michigan in the Western (Big Ten) Conference. Along with the Big Ten universities, it also is associated with The University of Chicago in the Committee for Institutional Cooperation (CIC).

As shown below, various colleges and schools of the University are members of accrediting associations in their respective fields.

Colleges

Business Administration—American Assembly of Collegiate Schools of Business

Dentistry—American Dental Association, Council on Dental Education

Education—National Council for Accreditation of Teacher Education

Law—American Bar Association; Association of American Law Schools

Medicine—Liaison Committee on Medical Education, representing the American Medical Association (AMA) and the Association of American Medical Colleges (AAMC)

Nursing—National League for Nursing; Iowa Board of Nursing

Pharmacy—American Council on Pharmaceutical Education

Schools

Journalism and Mass Communication—American Council on Education for Journalism and Mass Communication

Library and Information Science—American Library Association

Music—National Association of Schools of Music

Social Work—Council on Social Work Education

Departments and Programs

The undergraduate engineering programs of Biomedical, Chemical, Civil, Electrical, Industrial, and Mechanical Engineering—Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET)

Chemistry—American Chemical Society

Dental Hygiene—Commission on Dental Accreditation of the American Dental Association

Dietetics—American Dietetic Association

Hospital and Health Administration—Accrediting Commission on Education for Health Service Administration

Leisure Studies—Council on Accreditation of the National Recreation and Park Association

Medical Technology—Committee on Allied Health Education and Accreditation of the American Medical Association; National Accreditating Agency for Clinical Laboratory Sciences

Nuclear Medicine Technology—Committee on Allied Health Education and Accreditation, and Council on Medical Education, both of the American Medical Association

Physical Therapy—American Physical Therapy Association

Physician Assistant Program—Committee on Allied Health Education and Accreditation of the American Medical Association

Psychology—American Psychological Association

Speech Pathology and Audiology—Educational Standards Board of the American Speech and Hearing Association

Academic Sessions

The University's academic year consists of two semesters of approximately 16 weeks each. The University also conducts an eight-week summer session and, following that, an Independent Study Unit of from one to three additional weeks for students in the Graduate College and the College of Law.

Academic Recognition

The University recognizes high scholastic achievement by awarding degrees "with distinction," "with high distinction," and "with highest distinction," based on the following criteria.

All Undergraduate Colleges (except Pharmacy)

Highest distinction—highest 2 percent
High distinction—next highest 3 percent
Distinction—next highest 5 percent

College of Pharmacy

Highest distinction—grade-point average of 3.75 and above
High distinction—grade-point average of 3.50 to 3.74
Distinction—grade-point average of 3.25 to 3.49

Dean's List

Liberal arts students who achieve grade-point averages of 3.50 or above during a given semester on 12 or more semester hours of graded work and who have no hours of I or 0 grades are recognized by inclusion on the Dean's List for that semester.

President's List

Undergraduate students who achieve grade-point averages of 4.00 for two consecutive semesters on 12 or more semester hours of graded work and who have no hours of I or 0 grades are recognized by inclusion on the President's List.

Undergraduate Scholar Assistantships

For students who rank in the top one percent at the University, Undergraduate Scholar Assistantships provide undergraduates, including freshmen, a chance to do scholarly work with faculty members from all areas of the University on projects that range from art to Spanish, from music to medicine.

Depending on their interests and fields of study, undergraduate assistants might help in classrooms, do research in libraries, work in the field, perform laboratory experiments, gather and analyze data, program computers, or edit manuscripts.

The biggest reward from this ten-hour-a-week appointment is the working relationship students form with faculty members and the involvement they have in important teaching and research activities. As long as they maintain superior performance, assistants may be invited to continue their work throughout their college careers, allowing them to increase the breadth and depth of their scholarly work and to cement the mentor relationship with their faculty member.

Honorary and Professional Societies

Phi Beta Kappa, Sigma Xi, Mortar Board, and Omicron Delta Kappa are among 64 national honorary and professional societies that have active chapters on The University of Iowa campus.

University Marking System

Grade (Definition)	Grade points
A+	4.33
A (superior)	4.00
A–	3.67
B+	3.33
B (above average)	3.00
B–	2.67
C+	2.33
C (average)	2.00
C–	1.67
D+	1.33
D (below average)	1.00
D–	0.67
F (failing)	0

*H = honors
*I = incomplete
*N = nonpass
*O = no grade
*P = passing
*R = audit
*S = satisfactory
*U = unsatisfactory (Graduate College only)
*W = withdrawn

*Not used in computing grade-point averages

Grade-point averages displayed at the bottom of students' grade reports are truncated so as not to exceed 4.00.

The College of Law uses a numeric grading system.

Numbering of Courses

Each course in the regular University curriculum has an identifying number, preceded by the number of the college, department, or program that administers the course. For example, "2:1" is the code for the course numbered 1 in the Department of Botany (2), entitled "Introduction to Botany." Course numbers below 100 designate courses primarily for undergraduates, numbers 100 to 199 designate courses for undergraduates and graduates, and numbers 200 and above designate courses primarily for graduates.

College of Business Administration

6A	Accounting
6B	Business Administration
6E	Economics
6F	Finance
6J	Management and Organizations
6K	Management Sciences
6M	Marketing
6N	M.B.A. Program

College of Dentistry

82	Operative Dentistry
83	Endodontics
84	Prosthodontics
86	Oral Pathology and Diagnosis
87	Oral and Maxillofacial Surgery
88	Dental Hygiene
89	Orthodontics
90	Pediatric Dentistry
92	Periodontics
111	Preventive and Community Dentistry
112	Dentistry Nondepartmental
114	Family Dentistry

College of Education

7C	Counselor Education
7D	Educational Administration
7E	Elementary Education
7F	Social Foundations
7H	Higher Education
7P	Educational Psychology, Measurement, and Statistics
7S	Secondary Education
7U	Special Education
7W	Instructional Design and Technology
7X	Education Interdivisional

College of Engineering

51	Biomedical Engineering
52	Chemical and Biochemical Engineering
53	Civil and Environmental Engineering
55	Electrical and Computer Engineering
56	Industrial Engineering
57	Engineering Core
58	Mechanical Engineering

91 College of Law

College of Liberal Arts

000	Nondepartmental courses

BGS	Bachelor of General Studies courses
BLS	Bachelor of Liberal Studies courses
L	Lakeside Laboratory
1A	Fundamentals of Art
1B	Elements of Art
1C	Ceramics
1D	Design
1E	Art Education
1F	Drawing
1G	Metalworking and Jewelry
1H	Art History
1J	Multimedia and Video Art
1K	Painting
1L	Photography
1M	Printmaking
1N	Sculpture
1P	Art Interdepartmental
1X	Papermaking
1Y	Studio
2	Botany
3	Speech Pathology and Audiology
4	Chemistry
6	Prebusiness courses
8	English
8G	English General Education courses
8L	English Language and Linguistics Instruction
8P	English Professional
8W	English Writing
9	French
10	Basic Skills
11	Interdisciplinary courses
12	Geology
13	German
13D	Dutch
14	Greek
15	Open Major courses
16	History
16A	American History
16E	European History
17	Home Economics
18	Italian
19	Journalism and Mass Communication
20	Latin
21	Library and Information Science
22A	Applied Mathematical Sciences
22C	Computer Science
22M	Mathematics
22S	Statistics and Actuarial Science
23	Military Science
23A	Aerospace Military Studies
24	Museum Training
25	Music
26	Philosophy
27	Exercise Science
28	Physical Education and Sports Studies
29	Physics and Astronomy
30	Political Science
31	Psychology
32	Religion
33	Literature, Science, and the Arts
34	Sociology
35	Spanish
36	Communication Studies
36B	Broadcasting and Film
36C	Communication
36R	Rhetorical Studies
37	Biology
38	Portuguese
39	Asian Languages and Literature
39J	Japanese
41	Russian
41S	Soviet and East European Studies
42	Social Work
44	Geography
45	American Studies
47	Global Studies
48	Comparative Literature
49	Theatre Arts
61	Microbiology
97	Science Education
98	Social Studies
99	Biochemistry
102	Urban and Regional Planning
103	Linguistics
104	Leisure Studies
108	Letters
113	Anthropology
127	Genetics
129	African-American World Studies
130	Latin American Studies
131	Women's Studies
137	Dance
138	Physical Education, Teacher Preparation Program
140	Unified Program
141	African Studies
143	Honors
144	Philosophies and Ethics of Politics, Law, and Economics
145	Interdepartmental Studies

College of Medicine

50	Medicine Nondepartmental
60	Anatomy
61	Microbiology
62	Dermatology
63	Preventive Medicine and Environmental Health
64	Neurology
65	Human Nutrition
66	Obstetrics and Gynecology
67	Ophthalmology
68	Otolaryngology—Head and Neck Surgery
69	Pathology
70	Pediatrics
71	Pharmacology
72	Physiology and Biophysics
73	Psychiatry
74	Radiology
75	Surgery
76	Orthopaedic Surgery
77	Radiation Biology
78	Internal Medicine
79	Urology
80	Hospital and Health Administration
99	Biochemistry
101	Physical Therapy
115	Family Practice
116	Anesthesiology
117	Physician Assistant Program
132	Neuroscience
142	Molecular Biology

96 College of Nursing

46 College of Pharmacy

ADMISSIONS

High School Preparation

Appropriate academic preparation for college-level studies is very important. University course work is offered with the assumption that students have the necessary background and proficiency to perform successfully.

Effective with the fall semester 1990, students entering the University must have

completed the following set of high school courses (units) or their equivalents. These high school unit requirements apply to entering freshmen who graduated from high school after 1985; liberal arts transfer students with fewer than 24 semester hours of transferable credit who graduated from high school after 1985; and liberal arts transfer students with 24 or more semester hours of transferable credit who graduate from high school after 1990. Certain requirements vary for students enrolling in the College of Engineering (*noted in italics*).

Four years of English/language arts, with emphasis on writing, speaking, and reading as well as understanding and appreciation of the literature.

At least two years (but preferably four) of a single foreign language.

At least three years of mathematics, including two years of algebra and one year of geometry; in addition, a course in higher mathematics—trigonometry, analysis, or calculus—is recommended for students who plan to pursue a science major.

Students enrolling in engineering must meet the above mathematics requirements, including completion of a course in higher mathematics.

At least three years (but preferably four) of social studies course work; suggested study includes American and world history, anthropology, economics, geography, government, psychology, and sociology.

Students enrolling in engineering must have completed two years of social studies.

At least three years of science, including full-year courses from two of these areas: biology, chemistry, and physics; the third course can be from any area, including others not listed, such as general science, physical science, geology, astronomy.

For students enrolling in engineering, the three years of science must include one year of chemistry and one year of physics. Engineering also recommends, but does not require one year of computer programming.

At least one year of study in the performing arts, visual arts, or humanities is recommended but not required.

Applying for Admission

Prospective students interested in enrolling in any of the ten colleges of The University of Iowa should contact the Office of Admissions, Calvin Hall, The University of Iowa, Iowa City, Iowa 52242, to request application forms and application instructions for both admission and University housing. All applicants must submit formal applications, official transcripts, test scores, and other required supporting material to the Office of Admissions. For specific admission standards of the respective colleges, please refer to the appropriate collegiate sections of the *Catalog*.

ACT and SAT Scores

All entering freshmen and undergraduate transfer students who present fewer than 24 semester hours of transferable work are required to complete the American College Test (ACT) or Scholastic Aptitude Test (SAT) and have their scores reported to the University before they register for classes. The Office of Admissions recommends that students complete the ACT or SAT during the fall prior to their anticipated enrollment.

The scores from these exams are used as a criterion for admission, for placement purposes, for advising, and for awarding University-administered scholarships and loans.

Graduate and Professional College Examinations

Prospective Graduate College applicants should take the Graduate Record Examination (GRE) General Test or, if applying for admission to a department of the College of Business Administration other than economics, the Graduate Management Admission Test (GMAT). Prospective students of the Colleges of Dentistry, Law, or Medicine are required to take admission tests of the respective colleges.

Application Fees

A $20 application fee must accompany applications submitted by prospective students not previously enrolled for full-time study at the University. The application fee for foreign students is $30. Graduate College applicants must pay the fee unless they have earned a degree from The University of Iowa. Application fees are not refundable except to Iowa residents who are denied admission.

Application Deadlines

U.S. Citizens

Entering freshmen are urged to apply early in the fall of their senior year to arrange for University housing and to apply for financial aid. Entering transfer students and graduate students are encouraged to apply well in advance of the session in which they plan to enroll. All application materials are due in the Office of Admissions by the deadlines listed below. Foreign students usually have earlier application deadlines (see "Foreign Students" section).

College of Liberal Arts—May 15 for summer session, May 15 for fall semester, November 15 for spring semester.

College of Business Administration—May 1 for summer session, May 1 for fall semester, December 1 for spring semester.

College of Dentistry—November 30, fall semester only; preliminary applications should be on file with the American Association of Dental Schools Application Service by this date. Notification of acceptance will begin December 1.

College of Engineering—May 15 for summer session, May 15 for fall semester, November 15 for spring semester; early application is advised since enrollment may reach capacity far in advance of the beginning of classes.

Graduate College—General Graduate College deadlines: May 1 for summer session, July 15 for fall semester, December 1 for spring semester. Individual departments and programs may have earlier deadlines, which are indicated in their materials. All departmental materials should be reviewed carefully for information about early deadlines. To be considered for graduate awards, students must apply by February 1 for the fall semester.

College of Law—March 1 for summer session or fall semester.

College of Medicine—December 1, fall semester only; Early Decision Plan, August 1 for the following year; preliminary applications must be submitted to the American Medical Colleges Application Service by these dates.

College of Nursing—March 1 for summer session, May 1 for fall semester, December 1 for spring semester.

College of Pharmacy—March 1, fall semester only.

Dental Hygiene Program—March 1, fall semester only.

Pharm.D. Program—February 1, summer session only.

Physician Assistant Program—January 15, summer session only.

Teacher Education Program—May 15 preceding the academic year in which the student plans to enroll in professional education courses.

Foreign Students

Foreign students should begin the process of applying for admission at least 12 months prior to enrollment. Applicants must satisfy all application procedures and submit their complete application file to the Office of Admissions by the following dates.

Graduate College—Students applying to The University of Iowa for financial assistance (scholarships, fellowships, assistantships): February 1 for summer session or fall semester, October 1 for spring semester.

Students applying to the Graduate College who will not require University financial support: March 1 for summer session, April 15 for fall semester, October 1 for spring semester.

Note: The preceding deadlines are general Graduate College deadlines. Individual departments and programs may have earlier deadlines, which are indicated in their materials. All departmental materials

should be reviewed carefully for information about early deadlines.

College of Business Administration—March 1 for summer session, March 1 for fall semester, September 1 for spring semester.

College of Engineering—March 1 for summer session, March 1 for fall semester, September 1 for spring semester.

College of Liberal Arts—March 1 for summer session, April 15 for fall semester, October 1 for spring semester.

College of Nursing—April 15 for fall semester, October 1 for spring semester.

College of Pharmacy—March 1 for fall semester.

Determining Residence

For admission, tuition, and fee purposes, the University registrar classifies all students enrolling in the University as residents or nonresidents of Iowa according to criteria established by the State Board of Regents and on the basis of information provided by the student and all other relevant information. The criteria may be found under "Iowa Administrative Code: Board of Regents" at the back of the *Catalog*.

English Proficiency

Non-Native Speakers

The University's English proficiency requirement assures that non-native speakers know English well enough to study without being hindered by language problems, to understand lectures, and to participate successfully in class discussions. All applicants to the University whose native language is not English are required to submit scores on the Test of English as a Foreign Language (TOEFL) along with their applications for admission and supporting academic documents. Automatic waivers from this policy are granted for persons who already have received a baccalaureate or equivalent degree from a university in the United States, the United Kingdom, Canada (excluding French Quebec), Africa (English speaking), Australia, or New Zealand.

U.S. Citizens and Permanent Residents

U.S. citizens and permanent residents whose native language is not English are required to submit scores on the TOEFL before registering for courses. Exceptions to this requirement are made in the cases of:

Graduates of Iowa high schools whose ACT composite score is 24 or above (SAT combined score of 980 or above) *and* whose ACT English subscore is 21 or above (SAT 430).

Nonresidents of Iowa whose ACT composite score is 25 or above (SAT combined score of 1020 or above) *and* whose ACT English subscore is 21 or above (SAT 430).

Admitted applicants whose TOEFL scores are 600 or above may begin academic course work without restriction. Those whose TOEFL scores fall below 600 will be required to sit for additional English language proficiency testing before they register for courses.

Applicants seeking exceptions are directed to the coordinator of English as a Second Language.

Foreign Students

Undergraduates

Undergraduates who present TOEFL scores below 530 are not considered for admission to the University. Admitted applicants whose TOEFL scores are 600 or above may begin academic course work with no restrictions.

Applicants whose academic credentials indicate that they should be admitted but whose TOEFL scores fall between 530 and 599 may be offered admission to the University. However, placement in regular academic courses is made only after the student's English language proficiency has been evaluated through on-campus testing.

Graduates

A minimum TOEFL score of 530 is required for admission to the Graduate College. Newly admitted graduate students who present TOEFL scores below 600 are required to sit for English proficiency testing before their first registration for courses. Some departments may require students to enroll in courses in English as a Foreign Language until their English proficiency reaches the appropriate level.

Graduate students should consult their departmental academic advisers to determine whether or not they should enroll in course work in English as a Foreign Language.

English Proficiency Evaluations

On-campus proficiency evaluations are conducted by the Department of Linguistics. If such evaluation warrants, students are required to enroll either in credit-granting courses in English as a Second Language or in the noncredit Iowa Intensive English Program until their language proficiency reaches the appropriate level. Once such proficiency has been established, students are allowed to take a full academic course load, exclusive of English as a Second Language courses. Such students may begin their academic course work only upon the written recommendation of the coordinator of English as a Second Language. (Courses for non-native speakers of English are described under "Linguistics" in the College of Liberal Arts section of the *Catalog*.)

Medical Information

The Student Health Service provides health care for registered students. After students are admitted to the University, they receive a medical history form, which they must complete, including all information about immunizations. Proof of immunity to measles is a prerequisite to registration. Completed medical history forms should be returned to the Student Health Service. For students who have health problems, the University recommends that the attending physician send a report to the Student Health Service so that continuing care can be provided.

Campus Visits

The best introduction to The University of Iowa is a visit to the campus. Students and their parents are encouraged to visit on a weekday when classes are in session.

Campus visits might include a visit with an admission counselor, a group information session, a campus tour, and an appointment with a faculty member or academic adviser in a particular field. Answers are provided to questions about academic programs, admission requirements, financial aid, campus life, housing, and the many student services available at the University. Students also can explore UI museums, libraries, and downtown Iowa City.

Campus visits start at the John G. Bowman House Admissions Visitors Center, located at 230 North Clinton. The center is open from 8:30 a.m. to 4:30 p.m. Monday through Friday and from 9 to 11 a.m. on selected Saturdays.

Orientation Services

With the aid of representative student, faculty, and staff personnel, Orientation Services designs and conducts a wide variety of year-round programs to help new freshmen, transfer students, and foreign students make a transition to University life.

Once admitted to the University, students are expected to attend an orientation/registration program before they begin classes. During orientation, new students learn about academic policies and procedures, take placement tests, tour the campus, meet with their academic advisers, complete their first registration, and become acquainted with faculty, staff, and other students. Parents are encouraged to attend special parent orientation sessions conducted concurrently with the student programs.

Freshmen and transfer students admitted for the fall semester attend an orientation/registration program during the summer or just prior to the start of classes. Students admitted for the spring semester attend a session in December or during the week preceding the start of the semester. Students admitted for the summer session attend an orientation program the Sunday before classes begin in June.

Services for Transfer Students

The Office of Admissions provides a variety of services to help prospective transfer students make a smooth transition to University life. Students are encouraged to contact the office with questions concerning admissions criteria, programs of interest, and course equivalencies.

Admissions representatives annually visit each Iowa area community college and are available to answer questions via scheduled appointments, written correspondence, or by telephone. A variety of written materials is available to help students understand programs and policies.

The admissions office also maintains a transfer course equivalency system that provides accurate and consistent information on how individual courses from specific transfer institutions fit various degree programs at The University of Iowa. Admitted students receive a summary of this evaluation prior to their first registration.

Records

All academic records are maintained by the Office of the Registrar and are not released without permission of the student.

Regents Exchange Program

University of Iowa students may take courses at either of the other two Regents universities for University of Iowa resident credit. Regular, degree-bound students in good standing at any of the three Regents universities may attend another Regents university for a maximum of two semesters; the credits earned at the other university are counted as resident credit at the home institution.

Approval for participation and credit in the exchange program must be obtained well in advance of registration. The department head must approve the acceptance of such credits if they are to apply to the major, and time must be allowed to ensure complete processing of the application between the cooperating universities within the dates specified for enrollment. Detailed information and application forms for the exchange program are available from the Office of the Registrar.

TUITION AND FEES

The University's schedule of tuition and fees for full-time students, per semester, for the academic year 1990-91 is stated below. Extension courses are $124 per semester hour for graduate students and $79 per semester hour for undergraduates; M.B.A. extension courses are $160 per semester hour. Correspondence courses are $57 per semester hour. All fees are subject to change by action of the State Board of Regents.

Undergraduate	
Resident	$940
Nonresident	3,110
Graduate	
Resident	1,113
Nonresident	3,242
Dentistry	
Resident	2,132
Nonresident	5,997
Law	
Resident	1,212
Nonresident	3,849
Doctor of Pharmacy	
Resident	1,210
Nonresident	3,849
Medicine	
Resident	2,962
Nonresident	7,675

General fees provide for the student's use of the Iowa Memorial Union, libraries, laboratories, and gymnasia; free admission to some sports events and to student-faculty concerts; reduced rates for admission to University athletic events and theater productions and to performances by visiting stage and concert artists; subscriptions to the student newspaper, *The Daily Iowan*, delivered to housing units; certain student hospital services; and other activities and services as announced.

Extension and correspondence fees do not provide for the benefits listed above.

Registration

All persons who attend University classes must first be admitted to the University and are required to register and pay the established tuition and fees. Students in the Graduate College and the Colleges of Business Administration, Engineering, Liberal Arts, Pharmacy, Dentistry, Law, Medicine, and Nursing may audit courses with proper approval. Students who audit courses are assessed a fee based on the lowest number of semester hours for which the course is offered that semester.

Payment of Student Accounts

The University mails a monthly bill for each student to an approved address. The bill includes charges incurred for tuition, room, board, and other expenses in residence halls and fraternities; car registration and parking fees; library and parking fines; and other departmental charges. Tuition and fees are billed three times each semester and once during the summer session. Tuition and fee adjustments occur on a monthly basis.

Refund Schedule

Students who withdraw registration during a regular semester receive reduction of fees assessed, as follows: during the first week of classes—90 percent; during the second week—75 percent; during the third week—50 percent; during the fourth week—25 percent. There is no reduction of fees for withdrawals after the fourth week of classes.

FINANCIAL AID

The University of Iowa has an excellent record of helping its students obtain scholarships, grants, loans, and other forms of financial assistance. Approximately 65 percent of Iowa students receive some form of aid. The Office of Student Financial Aid helps students sort through the many forms of aid available.

Application Procedure

Students must be accepted for admission to be considered for financial aid at the University. From January through April, all newly admitted students receive instructions on how to complete the financial aid filing process.

All students are encouraged to apply for aid. Many factors are taken into consideration in determining eligibility.

To determine eligibility for need-based aid, students and parents must provide information about their financial situations. Students must submit either the Financial Aid Form (FAF) to the College Scholarship Service (CSS) or the Family Financial Aid Statement (FFS) to American College Testing (ACT) as soon as possible, and they should have CSS or ACT send a copy of the need analysis to the UI Office of Student Financial Aid.

Filing the FAF or FFS and submitting all other required documents to the UI Office of Student Financial Aid promptly assures that students will be considered for all need-based awards offered by the University.

The FAF or FFS may be obtained from high school and community college counselors. The FAF and FFS are good for only one academic year. Students must reapply for aid each year.

How Aid Is Determined

The University of Iowa determines eligibility for need-based aid by the same method of family financial analysis used by other colleges and universities throughout the country. The steps are as follows.

- The University determines the estimated costs for an academic year; these include

tuition, fees, books, room and board, and personal expenses.

- Through the College Scholarship Service (CSS) or American College Testing (ACT) standard methodology, the University determines how much the student and his or her family should contribute, based on the family's income and assets.

- Financial need is determined by subtracting the expected family contribution from the estimated costs for an academic year at the University.

- Whenever possible, financial assistance is awarded toward meeting the student's financial need; however, due to the large number of applicants and the limited funds available, it usually is not possible to offer enough assistance to meet the financial need in full.

Eligibility for Aid

Students are eligible for federal financial aid if they are U.S. citizens or eligible noncitizens and are enrolled at least half-time in a degree program, and if they demonstrate financial need as determined by the FAF or FFS.

In order to maintain or establish eligibility for financial aid at the University, students must comply with the following Reasonable Academic Progress (RAP) standards.

- Minimum Semester Hours: Undergraduates must earn 20 semester hours per academic school year (fall, spring, and summer sessions combined); graduates must earn 12 semester hours per academic school year.

- Minimum Grade-Point Average: Undergraduates and graduates must maintain the minimum grade-point average requirement of the colleges in which they are enrolled.

- Duration of Eligibility: Undergraduates must complete their bachelor's degrees within six academic school years (12 semesters) or 124 semester hours; graduates working toward master's degrees must complete their program of study within four academic school years (eight semesters) or 48 semester hours; graduates working toward combined master's/doctoral degrees must complete their programs of study within eight academic school years (16 semesters) or 96 credit hours. Financial aid eligibility is canceled for one or more of the following reasons: exhausting one's duration of eligibility; failing to meet the requirements for semester hours completion and/or grade-point average; or failing to meet the minimum requirements of a probationary term. These and other requirements and exceptions are outlined in detail in the publication *Reasonable Academic Progress Standards*, available at the Office of Student Financial Aid.

Scholarships

Presidential, Alumni Association, and Dean's Scholarships

The University annually awards Presidential Scholarships to 20 high school students in recognition of their outstanding high school achievements. The scholarships include full-time tuition, as well as room and board, and are renewable for a maximum of four years, provided that the student maintains a 3.00 grade-point average at the University.

Alumni Association Scholarships are awarded to selected runners-up in the Presidential Scholarship competition. They provide full-time resident tuition for four years.

Dean's Scholarships, also merit-based, are awarded to selected top-ranking finalists in the Presidential Scholarship competition. These are freshman-year, nonrenewable scholarships equivalent to the amount of resident tuition.

For further information, students should contact their high school guidance counselor or the UI Office of Admissions.

The Iowa Center for the Arts Scholarship

The Iowa Center for the Arts Scholarships are awarded on the basis of exceptional talent in the fine arts. Each department (art, dance, theatre arts, and music) awards one scholarship to an entering freshman majoring in one of the areas. The scholarship, the highest award that these areas offer to entering freshmen, is a $2,500 freshman-year, nonrenewable stipend. Application deadlines for these awards fall between January and March of applicants' senior year of high school.

Application information is available from the UI Office of Admissions or from high school guidance counselors.

Opportunity at Iowa Scholarships

Opportunity at Iowa Academic Scholarships are the University's highest scholastic awards for entering minority freshmen. The scholarships include full-time tuition, as well as room and board, and are renewable for a maximum of four years, provided that the student maintains a 3.00 grade-point average at the University.

Opportunity at Iowa Achievement Scholarships are awarded to selected top-ranking finalists in the Opportunity at Iowa Academic Scholarship competition. Each scholarship carries an award of full-time tuition, which may be renewed for a total of four years, provided that the student maintains a 3.00 grade-point average at the University. Application information is available from the University of Iowa Office of Admissions or from high school guidance counselors.

National Merit Scholarships

The University offers National Merit Scholarships to all entering freshmen who have attained finalist status in the National Merit Competition. Students may receive it for up to four years. The minimum award is $750. Awards range from $750 to $2,000, based on financial need. The FAF or FFS determines need.

Freshman Honors Tuition Grants and Iowa Community College Transfer Grants

Entering freshmen in the College of Liberal Arts and transfer students with Associate of Arts degrees from Iowa community colleges whose eligibility for the College of Liberal Arts Honors Program does not require letters of recommendation are eligible for a $200 tuition grant. The limited funds are awarded on a first-come, first-served basis.

Departmental Scholarships

For information about departmental scholarships, students should inquire at the offices of the academic programs of interest.

University of Iowa Tuition Scholarships

The University of Iowa tuition scholarships are institutional funds awarded on the basis of financial need and academic achievement. To qualify, entering freshmen must have an ACT composite score of 28 or above or must rank in the upper 10 percent of their high school graduating class. Upperclassmen or transfer students must have at least a 3.00 cumulative grade-point average to qualify for the scholarship. The maximum amount of the scholarship is resident tuition, and the award is applied directly toward tuition. These scholarships are for undergraduates without a bachelor's degree who are enrolled full-time. The FAF or FFS determines financial need.

LaVerne Noyes Scholarships

LaVerne Noyes Scholarships are for U.S. citizens who are direct descendants of World War I army or navy veterans. Awards are based on financial need and are available to undergraduates without a bachelor's degree. Students must file the FAF or FFS and obtain the LaVerne Noyes application from the Office of Student Financial Aid. Application deadline is July 1.

University of Iowa Farm Scholarships

Farm scholarships are for entering freshmen who are residents of Iowa. Applicants must rank in the upper 25 percent of their graduating class, be enrolled full-time at Iowa, and live on an

Iowa farm operated by their parents. Students must file the FAF or FFS. Applications are available from the Office of Student Financial Aid and must be submitted by April 1.

Grants

Pell Grants

Undergraduate students without bachelor's degrees may apply for Pell Grants. These awards range from $200 to $2,300 per academic year, depending on financial need and federal funding. Students must be enrolled at least half-time in a degree program in order to be eligible. Students may use the FAF or FFS to apply for Pell Grants.

Supplemental Educational Opportunity Grants (SEOG)

The SEOG program provides federal aid to undergraduate students without bachelor's degrees who show exceptional financial need. The amount of the grant varies depending on financial need and federal funding. Recipients must be enrolled at least half-time. The FAF or FFS determines eligibility for this program.

Educational Opportunity Program (EOP) Grants

Institutional funds are awarded to minority students who show exceptional financial need. Parental income and asset information must be reported. The FAF or FFS determines eligibility for this program.

Graduate Tuition Grants

Graduate Tuition Grants are institutional funds for graduate students in degree programs. The number of grants is limited. Grants are based on financial need and are applied directly toward tuition. The FAF or FFS determines eligibility for these grants.

Loans

Perkins Loans

Perkins Loans are long-term federal loans based on financial need. The amount of the award varies depending on federal funding. Students must be enrolled at least half-time in a degree program. Repayment, at 5 percent interest, begins six months after recipients cease to be at least half-time students. The FAF or FFS determines eligibility for these loans.

Stafford Loans

Stafford Loans are low-interest loans made to students by lenders such as banks, credit unions, or savings and loan associations. These loans are insured by a guarantee agency in each state and reinsured by the federal government. Recipients must be enrolled at least half-time. The interest rate is 7-9 percent, and repayment begins when recipients cease to be at least half-time students. The FAF or FFS determines eligibility for these loans. Applicants must submit a Stafford Loan application, which is available from the lending institution.

PLUS Loans and Supplemental Loans for Students (SLS)

PLUS loans are for parent borrowers; the SLS is for students. Both loans provide additional funds for educational expenses. PLUS and SLS applications are available from banks, credit unions, and savings and loan associations. The loans have a variable interest rate that is adjusted each year. SLS borrowers must file the FAF or FFS.

Health Professions Student Loans

Health Professions Student Loans are long-term federal loans for students enrolled full-time in the Colleges of Medicine, Dentistry, or Pharmacy. Amounts available depend on federal funding. The interest rate is 5 percent. The FAF or FFS determines eligibility for this program.

Nursing Student Loans

Long-term federal loans are available for students enrolled at least half-time in the College of Nursing. Amounts available depend on federal funding. Repayment begins nine months after recipients cease to be half-time students. Interest is 5 percent. The FAF or FFS determines eligibility for these loans.

Jobs

Part-Time Jobs

Student part-time employment can provide a meaningful work experience as well as assistance in meeting educational expenses. The University of Iowa employs nearly 11,000 students in a variety of positions. Ranging from accountant to writer, the jobs offer students the opportunity to increase skills, gain experience, and earn money.

Student part-time employment is limited to 20 hours per week during the academic year and 40 hours per week during the summer session. The minimum wage paid by the University is $3.85 per hour. Students employed on an hourly basis are paid by check once every two weeks.

Jobs are advertised via computer terminals across campus.

The student newspaper, *The Daily Iowan*, also has job listings in the classified ads. Friends, advisers, and instructors are other possible sources of information about jobs. Students contact employers directly to arrange interviews. The Office of Student Financial Aid does not operate a referral or placement service for student employees. However, students who are hired for jobs on campus must come to the student employment area of the Office of Student Financial Aid, to process payroll paperwork.

College Work-Study Program

The College Work-Study (CWS) Program helps students earn money to meet educational expenses. This program currently is funded by both the U.S. Congress and the Iowa legislature. Students in the CWS Program must be enrolled at least half-time in a degree program and must meet the University's Reasonable Academic Progress standards. Their work experience should complement and reinforce their educational goals.

The amount of CWS money a student is eligible to earn is based on financial need as determined by the FAF or FFS and legislative funding. College Work-Study employment is limited to 20 hours per week during the academic year. The minimum wage paid by the University is $3.85 per hour. Students are paid by check once every two weeks.

Students who are awarded CWS receive a listing of all eligible job openings. This listing is updated weekly and is available every Wednesday afternoon from staff in the student employment area of the Office of Student Financial Aid.

Other Sources of Aid

A guidance counselor or high school principal may have information on local scholarships, and school or public libraries are excellent sources for publications about financial aid. Many places of employment, professional associations, and labor unions have programs to help pay the cost of education for children of employees or members. Other sources include foundations, religious organizations, fraternities or sororities, town or city clubs, community organizations, and civic groups. A little searching on the student's part may unearth some unexpected source of financial aid.

Information about financial assistance for physically handicapped students is available from the University's Office of Services for Persons with Disabilities.

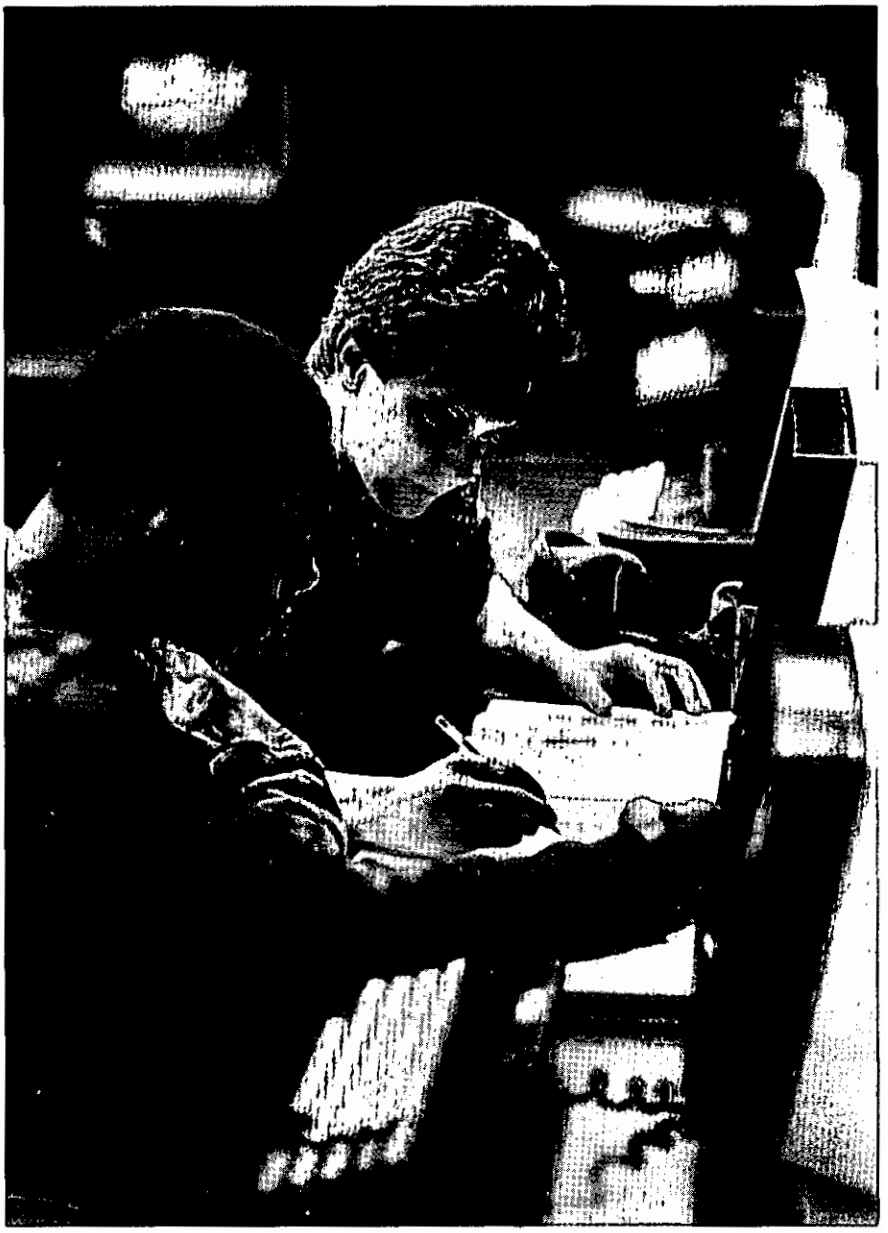
Information about financial assistance for veterans of U.S. military services is available from the University's Office of Veterans Services.

Information about Education Aid to War Orphans is available from the Iowa Bonus Board (State House, Des Moines, IA 50319).

Additional Information for Graduate Students

The primary sources of financial aid for graduate students are the University Teaching and Research Assistantships, Iowa Fellowships, Graduate College Block Allocation Fellowships, and Graduate Opportunity Fellowships. Scholarships, traineeships, and part-time employment also are available. Further information is available from academic departments or programs.

The resource room of the University's Division of Sponsored Programs has information on student aid available from non-University sources, such as foundations and professional associations.



Student Life at Iowa

ACADEMIC SERVICES

Academic Advising Offices

Academic Advising

Each student is assigned an academic adviser to assist with educational planning, academic counseling, and registration. Most entering freshmen, including open majors, certain preprofessional majors, some declared majors, are assigned advisers in the Undergraduate Academic Advising Center. Other entering freshmen with declared majors are assigned to advisers in their major departments. Upon admission to professional colleges (Business Administration, Education, Engineering, Nursing, Pharmacy, Dentistry, Law, and Medicine), students are advised by the college deans or their designated representatives. Graduate students are advised by their department heads and the Graduate College dean.

In addition to providing academic advising, advisers serve as general consultants to their advisees and refer those with special needs to appropriate support services.

Undergraduate Academic Advising Center

The Undergraduate Academic Advising Center serves primarily freshmen and sophomores. Professional advisers provide intensive advising support, maintaining systematic and frequent contact with their advisees. They help students select a program of study and learn about career options that relate to their academic programs. They also refer students to appropriate campus offices for assistance in academic, personal, and career counseling; academic skills development; and financial aid. The Advising Center's offices are located conveniently near the Clinton Street student residence halls.

Collegiate Academic Offices

Each of the University's undergraduate colleges maintains an academic/student affairs office. These offices are available to all students in the respective colleges to help with questions about admissions, academic majors, course requirements, grading options, career and degree plans, and other matters. They assist students who want to change advisers and/or majors, and they act on student complaints.

International Education and Services (OIES)

The OIES is the focal point of the University's international activities. It has administrative responsibility for the University's foreign student/scholar program and for the study abroad program. It also has developmental responsibilities in international studies, institutional linkages, and technical cooperation activities. The OIES works to enrich the campus by developing and promoting all aspects of its international dimension.

The OIES promotes development of international educational exchange and international studies and promotes technical cooperation. It also assists faculty and students who seek grants or fellowships for study or research with an international perspective.

Through technical cooperation and faculty exchange programs, the OIES encourages the development of formal links between University of Iowa departments and programs and their counterparts in foreign institutions.

The liaison officer for the Midwest Universities Consortium for International Activities (MUCIA) is located in the OIES, encouraging involvement of University of Iowa faculty in MUCIA activities.

Foreign student advisers provide information, counseling, and services related to orientation, financial aid, immigration regulations, and liaison with foreign governments and sponsoring agencies. They sponsor or support educational programs, such as the Friends of International Students, the Conversational English Partners, and lunchtime discussions that foster constructive interaction between students and scholars from other countries and their domestic counterparts. In short, they help with problems and questions in most areas except academic advising.

The OIES provides services and facilities and organizes extracurricular programs for both foreign and domestic students and faculty. It maintains a library with references on study, work, and travel in other countries, including information about foreign universities and study abroad programs open to UI students. The office helps students select study abroad programs to complement their on-campus academic programs and helps assure that they receive the correct credit for such activities.

It also helps students obtain information about and applications for the following scholarships: Fulbright, Marshall, DAAD (German Academic Exchange Service), Inter-American Foundation, International Student Identity Card, Tübingen Exchange, Presidential Scholarships for Study Abroad, and the Stanley Fellowships for Graduate Student Research Abroad.

Students considering study abroad should consult the Office of International Education and Services. The following are University of Iowa study abroad courses. Depending on the program, some may be counted as semester hours in residence or as transfer credit.

000:105 International Student Exchange Program arr.

000:106 HULL Exchange Program arr.

000:108 Nanzan Exchange Program arr.

000:110 Iowa Critical Languages Program arr.

000:112 University of Iceland Exchange Program arr.
Prerequisites: 3.00 GPA and 24 s.h. completed.

000:113 University of Lancaster Exchange Program arr.
Junior year at Lancaster; priority to business, psychology, and communication studies majors. Prerequisites: 3.00 GPA and 40 s.h. completed.

000:114 University of Strathclyde Exchange arr.

000:115 University of Aberdeen Exchange arr.

000:116 ACTR Programs in the Soviet Union arr.

000:802 Coe Exchange Program arr.

000:804 Iowa Regents' London Semester arr.

000:807 CIEE Alicante, Spain arr.
Language and area studies courses affiliated with the University of Alicante; development of intermediate language skills; students live in Spanish homes. Prerequisite: beginning Spanish.

000:808 CIEE Liberal Arts/Seville, Spain arr.
Academic courses including history, economics, geography, art history, and literature taught in Spanish by faculty of the University of Seville; directed teaching internships in Spanish schools. Prerequisite: five semesters of Spanish.

000:809 CIEE Language and Society/Seville, Spain arr.
Rapid development of listening comprephension, reading, writing, and speech; courses in Spanish history, culture, and civilization; daily interaction with Spaniards at the University of Seville and in the community. Prerequisite: three semesters of Spanish.

000:810 CIEE Business and Society/Seville, Spain arr.
Course work in Spanish business, society, and language; related field visits; overseas residence enables students to examine Spain's economy and business management in its own sociopolitical context. Prerequisites: intermediate Spanish and 6 s.h. of business/economics courses.

000:811 Basque Country Consort/Spain arr.
Language and civilization, literature, and social science in four track options.

000:813 CIEE Beijing University, China arr.

000:814 CIEE Nanjing University, China arr.

000:815 CIEE Fudan University, China arr.
Spoken Chinese and reading/listening; twelve-day study tour at conclusion. Offered summers only. Prerequisites: one year college-level Mandarin and one area studies course.

000:816 Social Science Program in Chile arr.

000:817 CIC Program in Mexico arr.

000:818 CIC Program in Quebec arr.

Placement Services

Professional staff of the Business and Liberal Arts Placement Office (BLAP) help students and graduates at every stage of the career planning process. With the guidance of BLAP advisers, students discover what they do well and enjoy, explore career options, and develop strategies to make their career search efficient and successful.

The Office provides programs and services for seniors and graduate students seeking employment in business, industry, government, and nonprofit agencies. Students and alumni can attend on-campus interviews that take place in the fall and spring, and can register for a subscription

to a weekly *Job Bulletin* (resume referral) and a reference file service.

In cooperation with the Alumni Association, the Career Information Network provides AlumNet, a networking service; externships; and other services that call on the help of alumni volunteers.

The office also provides programs on resume preparation, job hunting, and interviewing skills. Its Employer Literature Room offers information on employers, salaries, and employment trends. Offices are located in 24 Phillips Hall and a Federal Job Information Center is located in 380 Iowa Memorial Union.

In addition to placement services for liberal arts and business students, the office also coordinates placement information among the other collegiate placement centers on campus.

Careers Day, a cooperative event, is held each fall and offers students the opportunity to meet with hundreds of employers. A separate graduate and professional school fair is held each fall. A Summer Job Fair in the spring semester is also an annual event.

Career Information Services

The Career Information Services office is located in Room 286 of the Iowa Memorial Union. It provides individual advising and career exploration programs to help students from all colleges define their interests, abilities, values, and work and life-style preferences. SIGI, a computerized career decision-making program, is available to help students match their personal preferences with various career opportunities.

Career Information Center

This self-help reading room houses hundreds of resource materials on labor market trends, career options, academic requirements for specific careers, work environments, places of employment, salary ranges, advancement opportunities, and geographical regions of the country. The center also maintains information on developing strategies for finding jobs; researching organizations and nonprofit agencies; defining job objectives and writing resumes and cover letters; and improving interviewing skills. An adviser is on duty to help students use the material. No appointments are necessary.

The Career Information Center is located at 286 Iowa Memorial Union.

Cooperative Education

The UI Office of Cooperative Education, located in 315 Calvin Hall, is the primary campus resource for students interested in obtaining educational work experiences before they graduate. Undergraduate and graduate students may seek positions related to their academic and professional interests. Cooperative education assignments coincide with fall, spring, or summer semesters, with opportunities existing throughout Iowa, across the United States, and overseas.

Cooperative education experiences give students opportunities to assume responsibility, apply their studies in a supervised work situation, and receive compensation. Students also benefit from an inside look at different kinds of organizations, a chance to work in their field of study, and experience with state-of-the-art equipment and practices. With the approval and supervision of a cooperating faculty member, many students are able to use their cooperative education assignments as field experiences for academic credit.

Information about cooperative education opportunities is available from the Office of Cooperative Education and from the Career Information Center, 286 Iowa Memorial Union.

Ideally, students interested in this educational opportunity should visit the Office of Cooperative Education during their first year at the University.

Tutorial Labs

Mathematics Tutorial Lab

The Mathematics Tutorial Laboratory is integral to instruction in both pre-college and freshman level mathematics courses. Students are encouraged to use the math lab's programs and facilities, which include private and small group tutoring, self-instructional material, computer-assisted instruction, and diagnostic testing and advising.

The math lab holds tutoring hours throughout the day and on some evenings; no appointments are necessary. Students are encouraged to stop by the lab for help with their assignments; to use the lab as a resource for supplemental materials; to study in the lab's supportive environment; and to consult with their TAs concerning problems related to their math courses.

Reading Lab

The Rhetoric Program's Reading Lab provides one-on-one instruction for University students who want to improve their reading and study performance. At the lab, students work with rhetoric graduate instructors on course reading that is difficult for them or on elective reading based on their own interests.

Students schedule two hours per week in the lab, usually Mondays and Wednesdays or Tuesdays and Thursdays, to write about their reading and discuss it with their instructor. The also may work on reading rate/flexibility, University course requirements, monitoring and improving comprehension, and study skills.

Students may register for the lab at 12 English-Philosophy Building or by calling the lab or the Rhetoric Program.

Writing Lab

The Writing Lab provides individualized writing experiences for University students who feel inadequately prepared for college writing. Lab students discuss their work in personal conferences with teachers, who offer comments and suggestions to help the students become perceptive, critical readers of their own writing as they learn how to develop their ideas clearly and cogently.

Students can enroll for noncredit work in the lab throughout the semester. Or they can register for the credit course (10:9 Rhetoric, no credit toward degree) before or after taking a required rhetoric course, or transfer to 10:9 Rhetoric from another rhetoric course after discussing their writing problems with their rhetoric teacher and the director of the Writing Lab.

Registrar

The Office of the Registrar determines the residence status of each student, issues University identification cards, supervises registration procedures and coordinates commencement and academic special events programs. It assesses fees and fee adjustments, maintains all students' academic records, and issues official transcripts and verifications.

The registrar's office helps students determine graduation requirements, submit applications for degrees, and interpret college and University academic policies. It provides assistance to students on Selective Service and military service matters, and it helps student veterans apply and enroll at the University and secure receipt of their Veterans Affairs benefits.

Transcripts

Students who have completed work at The University of Iowa can obtain an official transcript of that work upon request to the Office of the Registrar. Fees are $3 for the first copy and $2 for each additional copy on the same order. For an additional $2 charge, students with proper identification can obtain immediate transcript service.

An official transcript cannot be issued for a student who has a past-due University account.

Services for Persons with Disabilities

The University of Iowa is committed to making its facilities, services, and programs fully accessible to people with disabilities. The Office of Services for Persons with Disabilities (SPD), located in Burge Residence Hall, provides assistance to students with a wide range of visible and nonvisible disabilities, including hearing

and speech impairments, learning disabilities, mobility impairments, visual impairments, and others. The office's goal is to help students with disabilities enjoy the same rights and assume the same responsibilities as do other students.

SPD works closely with University faculty and staff to provide assistance with admission, orientation, academic and career planning, academic support services, financial aid, housing, transportation and parking, aide and attendant care, and health services. The office works with students individually to locate the type of assistance appropriate to their needs, from tutors or personal attendants to tape recorders to emergency-loan wheelchairs.

Special Support Services

The Office of Special Support Services, located in Calvin Hall, reinforces the University's commitment to increase racial diversity in the student body and provide eligible students with academic, social, and financial support.

Special Support Services includes the Upward Bound Project and New Dimensions in Learning.

GENERAL SERVICES

Campus Information Center

Located in the east terrace lobby of the Iowa Memorial Union, the Campus Information Center provides information about campus and community activities and University services and operations; refers inquiries to appropriate campus and community resources; and compiles a master calendar of campus events. It also coordinates a roommate matching service and maintains the Housing Clearinghouse, which provides up-to-date listings of available rental units, city and campus maps, lists of realtors, hotels, motels, and apartment complexes. The center is open seven days a week.

Campus Programs and Student Activities

The Office of Campus Programs and Student Activities (OCPSA), located in the Iowa Memorial Union, provides diverse and balanced social, cultural, recreational, and educational programs and activities in the Iowa Memorial Union and on The University of Iowa campus. It helps students and student organizations design, build, and maintain educational environments that enhance their growth.

Students are welcome to seek guidance from professional advisers in the OCPSA about how they can find and become involved in organizations suited to their interests. Those with special needs who want to form new groups or organizations can request guidance from the OCPSA staff.

The office presents workshops on enhancing leadership skills to student organizations and individuals upon request. It also sponsors the Student Volunteer Clearinghouse, a program designed to incorporate local volunteer agencies with University students interested in volunteer service.

Campus programming and special event planning are ongoing tasks for OCPSA. The office plans traditional events such as Homecoming and Riverfest; minority and international events and festivals; and new campus programs. It programs major concerts and is responsible for the Arts, Craft, and Recreation Area; the Student Activities Center; the University Box Office; Campus Programs Business Service; SCOPE; Fine Arts Council; Union Board; the Afro-American Cultural Center; and the Chicano/Indian American Cultural Center.

Cultural Centers

Afro-American Cultural Center and Chicano/ Indian-American Cultural Center

The University operates the Afro-American Cultural Center and the Chicano/Indian American Cultural Center under the auspices of the Office of Campus Programs and Student Activities. Sudents meet at the centers to share experiences, find mutual academic and personal support, relax, and develop social programs, all in an atmosphere that emphasizes their cultural heritage.

The Afro-American Cultural Center sponsors discussion groups, orientation programs, movies, and class sessions. The house is decorated with art by African and Afro-American artists and has study areas, a kitchen, and a library of publications by African, Afro-American, and Third World authors.

The Chicano/Indian American Cultural Center sponsors conferences, lectures, and workshops on cultural themes. The center also houses a library of special interest books and periodicals and displays wall murals painted by students and guest artists.

International Center

The International Center serves members of the University community who have international interests. Its facilities and programs are designed to encourage interaction among people of all cultures.

The International Center Lounge is open to University and Iowa City individuals and to groups sponsored by an International Center unit.

Sports and Recreation

Intercollegiate Athletics for Men

The University of Iowa is a member of the Intercollegiate Conference of Faculty Representatives (Big Ten) and has athletic programs in football, basketball, track and field, baseball, swimming, golf, wrestling, tennis, cross-country, and gymnastics. Operating policies are determined by the Board in Control of Athletics, which is composed of 12 members from the University's teaching and administrative staff, two University alumni, one representative from the University Staff Council, and two students.

Intercollegiate Athletics for Women

The University of Iowa sponsors nationally competitive intercollegiate athletic varsity teams for women in basketball, cross-country, field hockey, golf, gymnastics, softball, swimming and diving, tennis, track and field, and volleyball. It competes as a member of the Big Ten Conference and the National Collegiate Athletic Association (NCAA). Athletic scholarships are available in all ten programs to qualified student-athletes. Women's Intercollegiate Athletics is governed by the University Board in Control of Athletics.

Recreational Services

The Division of Recreational Services, located in the Field House, administers one of the most diverse recreation programs in the country. There are seven major programming areas in which students, faculty, and staff may participate.

The Intramural Program

More than 30 different intramural sports are offered. Activities vary from popular team sports such as basketball and flag football to individual and novel activities such as trapshooting and wallyball.

Sports Clubs

Recreational services advises and funds more than 20 sport clubs organized by individuals to further their interest in a sport or recreational activity. Clubs range from competitive team clubs such as soccer and rugby to recreational clubs such as sailing and table tennis.

Lesson Programs

Recreational services offers a variety of noncredit instructional classes for all age groups throughout the school year. To defray the cost of providing instruction, the office charges a minimal registration fee for each program. Typical lesson programs

include gymnastics, golf, tennis, swimming, scuba diving, and various martial arts classes.

The division also offers fitness programs that stress aerobic exercises designed for people of all ages and fitness levels.

Informal Recreation

An informal drop-in recreation program is available for popular activities, including basketball, swimming, racquetball, volleyball, tennis, weight training, and jogging.

Outdoor Recreation

The division operates the Macbride Nature Recreation Area, one of the finest university-managed outdoor programs in the country. The 435-acre nature area, located 15 miles north of Iowa City on Lake Macbride and the Coralville Reservoir, offers picnic and camping sites, nature trails, an outdoor archery range, a raptor/nature center, and some of the finest cross-country ski trails in the Midwest. It also is the site of day camps and nature awareness programs for elementary school children.

The division also sponsors a weekend outdoor trip program that features a wide variety of activities such as white water rafting and canoeing, backpacking, bicycling, kayaking, rock climbing, horseback riding, cross-country and downhill skiing, and spelunking. An outdoor check-out service, located at 700 South Clinton Street, offers all types of outdoor equipment, including cross-country skis, picnic equipment, canoes, backpacks, skates, and tents.

Persons with Disabilities

Recreational services has a weight and exercise room with equippment especially for persons with disabilities. In addition, recreation staff members are available to help disabled students who want to be mainstreamed into regular recreational services programs. The division offers a limited number of programs strictly for persons with disabilities.

Summer Sports Camps

The University of Iowa has one of the largest summer sports camp programs in the Midwest. All popular team sports are offered, such as boys' and girls' basketball, coed swimming, football, volleyball, wrestling, track and field, golf, boys' and girls' gymnastics, soccer, baseball, softball, and tennis. There also are unique camps in activities such as cheerleading, and sports medicine.

Iowa Memorial Union

The Iowa Memorial Union is the hub of student life. Its facilities include a copy center; the Campus Information Center; the University Box Office and check cashing service; the Office of Campus Programs and Student Activities; the Wheelroom, which offers live entertainment; a variety of food services; a recreation area with billiards and electronic games; a barbershop; an arts and craft resource center; a bookstore; rooms for lectures, concerts, meetings, and social events; and art and sculpture display areas.

The adjoining Iowa House has 110 guest rooms for parents, alumni, conference participants, and other visitors to the campus.

Also housed in the union are the Student Activities Center and student organization offices, the Business and Liberal Arts Placement Office, the Career Information Services office, and the Center for Conferences and Institutes.

Student Health Service

Student Health Service is located in the Steindler Building on the University health center campus. All students registered at the University, except those registered in off-campus courses, are eligible for outpatient care at the Student Health Clinic. Visits are free, but charges are made for laboratory procedures, X-rays, accident examinations, minor surgery, and some special procedures.

All students are advised to have health and accident insurance. A University-sponsored group insurance is available for students in individual or family plans. This insurance policy must be obtained prior to or during the registration period and is available through the Business Office in Jessup Hall.

University Counseling Service

The University Counseling Service (UCS) is committed to fostering a multicultural environment. Its staff of professional psychologists, social workers, and advanced doctoral students offers learning disability assessment and career and personal counseling and therapy in individual, couple, or group sessions. UCS also offers programs, workshops, and consultation activities. Most of its services are available to students without cost, but there is a minimal fee for psychological testing.

Veterans Services

The Office of Veterans Services is part of the Office of the Registrar. It serves veterans, dependents of veterans, servicemen, and servicewomen in matters relating to Veterans Affairs educational benefits, University registration, and study at the University.

Women's Resource and Action Center

The Women's Resource and Action Center (WRAC) provides services to meet educational, cultural, social, and personal needs of University and community women. WRAC advocates the removal of all barriers to equal access and self-determination, including barriers of racism and classism as well as those based on physical ability, sexual preference, and gender. Through its feminist programs and services, the WRAC staff is committed to empowering Iowa women through providing information, skills, and support.

The WRAC provides a resource for many women's organizations; sponsors a Brown Bag Luncheon program; offers evening and weekend workshops, lectures, films, and classes; provides a wide variety of support and discussion groups for women; offers one-to-one problem-solving sessions for women; and publishes a newsletter nine times a year.

The WRAC houses the Sojourner Truth Women's Resource Library of books and periodicals on a wide range of women's topics. For persons dealing with sexual harassment and other forms of discrimination, WRAC acts as an advocate and provides emotional and informational support. WRAC maintains an information and referral system, a speakers bureau, and an active volunteer program.

HOUSING

Fair Housing Policy

The following is the University's statement on fair housing practices: "It is and shall be the firm policy of the University that householders shall rent to all students on the basis of their individual merits as persons, without exclusion or discrimination on the basis of race, creed, color, or national origin."

Iowa City has a fair housing ordinance providing for equal opportunity to secure housing without distinction due to race, religion, or ancestry, except in certain instances involving owner-operator dwelling units. A Human Relations Commission is responsible for the observance of this ordinance and for the initiation of redress for violations of it.

University Residence Halls

The University's nine residence halls provide housing and dining accommodations and academic and program support for 6,200 single students; 749 families reside in apartments operated by the Department of Residence Services.

University residence hall furnishings, facilities, and services are designed to

provide a pleasant atmosphere conducive to effective study.

Single, double, triple, and quadruple rooms with full or partial board are available in the Grand Avenue Residence Halls (west campus), which include Hillcrest, Quadrangle, Rienow, and Slater halls, and in the Clinton Street Residence Halls (east campus), which include Burge, Currier, Daum, Mayflower, and Stanley halls. There are lounges, study areas, television or game rooms, coin laundry facilities, and small stores in or available to each residence hall. Computer terminals, reference materials, browsing libraries, and private rooms for group study sessions are available in four monitored learning centers.

Each residence hall is divided into small living units. Each building has a live-in hall coordinator, and there is a student resident assistant living on each floor. All students are encouraged to participate in residence hall government to plan programs and discuss issues.

Student- and staff-initiated programs and activities provide opportunities for students to pursue social, recreational, cultural, and educational interests. Many academic classes are taught in residence halls. An academic advising center is located in Burge Hall and tutorial sessions also are available there.

All students living in residence halls must contract for a food plan, with the exception of Mayflower residents, who may contract for room only. Students who do not live in residence halls may purchase full or partial board contracts.

Applications and Assignments

Prospective undergraduate students should request housing application forms to apply for residence hall accommodations. Students applying for residence hall accommodations should read the terms and conditions of the contract, provide all information requested on the application form, sign the contract portion, and return the completed application/contract with a check for $50 to the University Housing Assignment Office, Burge Hall.

Applicants who want to room together should enter each other's name and social security number under "Roommate Request" on the application for residence hall accommodation. They also should list the same preferences—room type, building, guest policy, special housing options—and list "roommate" as their first-priority preference on the application.

Applicants do not receive room assignments until they have been admitted to the University. However, they may apply for housing at the same time they apply for University admission.

The residence hall application/contract and $50 advance payment constitute a contract offer. Applicants may withdraw by notifying the University Housing Assignment Office in writing before their application becomes a binding contract. The application becomes binding approximately ten days after the University Housing Assignment Office issues notice of acceptance of the contract and assignment of accommodations.

Upon written request, the $50 advance payment is refunded to applicants who are not admitted to the University and to those who cancel their residence hall contracts in accordance with the terms and conditions set forth in the contract.

Rates

Basic rates for University residence hall accommodations for the 1989-90 academic year are $2,580 for a double room and $2,399 for a triple, with full board (20 meals per week). Rates for room and board options vary according to accommodations. Rates are subject to change annually.

Family Housing

There are 749 University-operated apartments for married students or legally defined family units in the Hawkeye Drive, Hawkeye Court, and Parklawn complexes.

Monthly rents for 1989-90 academic year were $142.25 for efficiencies, $188.25 to $192.75 per month for one-bedroom units, and $227.25 to $284.75 for two-bedroom units. Rent includes telephone with on-campus and local service, but not gas or electricity. All units are unfurnished. Rates are subject to change annually.

Family housing is assigned according to the order in which applications are received. Applicants must meet all University admission requirements before assignments can be made. Applications may be filed before admission is complete, but they are not accepted more than a year in advance.

Off-Campus Housing

The Housing Clearinghouse, located at the Campus Information Center in the Iowa Memorial Union, maintains and provides accurate, up-to-date listings of available rental units in the Iowa City area, including large apartment complexes, smaller complexes, rooms in private homes, and one-, two-, and three-bedroom duplexes and houses. The clearinghouse also suggests other resources useful in looking for housing and offers a packet of helpful information for prospective residents of the area.

Fraternities and Sororities

Thirty undergraduate social fraternities and 19 undergraduate social sororities exist on the Iowa campus. Twenty-two fraternities and 15 sororities operate chapter houses, which accommodate 35 to 60 people each.

Undergraduate fraternities include Acacia, Alpha Epsilon Pi, Alpha Kappa Lambda, Alpha Phi Alpha, Alpha Tau Omega, Beta Theta Pi, Delta Chi, Delta Tau Delta, Delta Upsilon, Kappa Alpha Psi, Kappa Sigma, Lambda Chi Alpha, Omega Psi Phi, Phi Beta Sigma, Phi Delta Theta, Phi Gamma Delta, Phi Kappa Psi, Phi Kappa Sigma, Phi Kappa Theta, Pi Kappa Alpha, Sigma Alpha Epsilon, Sigma Alpha Mu, Sigma Chi, Sigma Lambda Beta, Sigma Nu, Sigma Phi Epsilon, Sigma Pi, Sigma Tau Gamma, Tau Kappa Epsilon, and Theta Xi.

Undergraduate sororities include Alpha Chi Omega, Alpha Delta Pi, Alpha Gamma Delta, Alpha Kappa Alpha, Alpha Phi, Alpha Xi Delta, Chi Omega, Delta Delta Delta, Delta Gamma, Delta Sigma Theta, Delta Zeta, Gamma Phi Beta, Kappa Alpha Theta, Kappa Kappa Gamma, Pi Beta Phi, Alpha.

CODES, POLICIES, AND STUDENTS' RIGHTS

Code of Student Life

As members of the academic community, students are encouraged to develop a capacity for critical judgment and to engage in a sustained and independent search for truth. Freedom to teach and freedom to learn are inseparable facets of academic freedom. The freedom to learn depends on appropriate opportunities and conditions in the classrooms, on the campus, and in the larger community. To provide and safeguard the right of every individual student to exercise this freedom to learn without undue interference by others, the University has developed a Code of Student Life. The code covers conduct that adversely affects a University process or function or some distinct and clear interest of the University as an academic community. In order to foster an environment where academic freedoms are exercised in a responsible manner, all students are expected to acquaint themselves with the code and to conduct themselves in accordance with the standards it sets forth.

University Policy on Human Rights

The University of Iowa brings together in common pursuit of its educational goals persons of many nations, races, and creeds. The University is guided by the precept that in no aspect of its programs shall there be differences in the treatment of persons because of race, creed, color, national origin, age, sex, disability, and any other classifications that deprive the person of consideration as an individual, and that equal opportunity and access to facilities shall be available to all. Among the classifications that deprive the person of consideration as an individual are those based on affectional or associational preference. This principle is expected to be

observed in the internal policies and practices of the University, specifically in the admission, housing, and education of students; in policies governing programs of extracurricular life and activities; and in the employment of faculty and staff personnel. The University shall work cooperatively with the community in furthering these principles.

Student Complaints Concerning Faculty Actions

Student complaints concerning actions of faculty members are pursued first through the informal mechanism established in each college for this purpose.

Although there is some variation among colleges, these mechanisms generally involve the following steps:

- The student should first attempt to resolve the issue with the faculty member involved.
- Lacking a satisfactory outcome, the student should turn to the departmental executive officer, if any.
- If a satisfactory outcome still is not obtained, the student may take the matter to the collegiate dean. In addition, graduate students should consult with the associate dean for academic affairs in the Graduate College concerning ways to resolve complaints.

Some colleges (Dentistry, Education, Engineering, Law, Medicine, Nursing, and the Graduate College) also have established an ombudsperson system as an alternative mechanism for handling student complaints. Information concerning the informal mechanisms established in a specific college is available in the collegiate dean's office or The University of Iowa Student Association (UISA).

If a student complaint concerning faculty actions cannot be resolved through the informal mechanisms available, the student may file a formal complaint, which will be handled under the procedures established for dealing with alleged violations of the "Statement on Ethics and Academic Responsibilities," as specified in section 20:290 of the *University Operations Manual*. A description of these formal procedures, found in section of 20:260 of the *University Operations Manual*, can be obtained from each college dean's office; offices of collegiate ombudspersons; the Liberal Arts Office of Academic Programs; the Undergraduate Academic Advising Center; and the office of the Collegiate Associations Council.

University Ombudsperson

The Office of the University Ombudsperson responds to problems and disputes brought forward by all members of the University community— students, staff, and faculty—that appear unresolvable through existing channels. The ombudsperson investigates claims of unfair treatment or erroneous procedure and serves as a neutral and detached listener, information resource, adviser, intermediary, and mediator. The ombudsperson considers all sides of a question in an impartial and objective way.

The ombudsperson's office is an independent entity. It is not part of and does not report to the University administration. It treats all requests and consultations in strict confidence. It never divulges a client's name or the nature of his or her complaint without the client's consent.

Before consulting the ombudsperson, students, staff, and faculty should try to resolve their problems by following procedures outlined by University rules and policies. Where practical, faculty and staff members should discuss problems with department chairs and/or supervisors; students should follow procedures in the handbook *Policies and Regulations Affecting Students*. Students, staff, and faculty usually should consult the appropriate academic adviser, department head, supervisor, chair, dean, or other administrator before contacting the ombudsperson.

They may consult the ombudsperson at the outset, however, if using official channels would result in lengthy and damaging delays or a lack of confidentiality and/or impartiality detrimental to their case.

The ombudsperson has no power to order changes in rules, regulations, policies, procedures, or the behavior of others. Solutions reached through the Office of the Ombudsperson are not binding; it is the responsibility of the parties involved to see that the solutions are implemented.

Policy on Sexual Harassment

Following are excerpts from the University "Policy on Sexual Harassment and Consensual Relationships," which is printed in full in the booklet *Policies and Regulations Affecting Students*.

Division 1. Sexual Harassment

Section 1. Rationale

(a) Sexual harassment is reprehensible and will not be tolerated by the University. It subverts the mission of the University and threatens the careers, educational experience, and well-being of students, faculty, and staff. Relationships involving sexual harassment or discrimination have no place within the University. In both obvious and subtle ways, the very possibility of sexual harassment is destructive to individual students, faculty, staff, and the academic community as a whole. When, through fear of reprisal, a student, staff member, or faculty member submits or is pressured to submit to unwanted sexual attention, the University's ability to carry out its mission is undermined.

(b) Sexual harassment is expecially serious when it threatens relationships between teacher and student or supervisor and subordinate. In such situations, sexual harassment exploits unfairly the power inherent in a faculty member's or supervisor's position. Through grades, wage increases, recommendations for graduate study, promotion, and the like, a teacher or supervisor can have a decisive influence on a student's, staff member's, or faculty member's career at the University and beyond.

(c) While sexual harassment most often takes place in situations of a power differential between the persons involved, the University also recognizes that sexual harassment may occur between persons of the same University status. The University will not tolerate behavior between or among members of the University community that creates an unacceptable working or educational environment.

Section 2. Prohibited Acts

No member of the University community shall engage in sexual harassment. For the purposes of this policy, sexual harassment is defined as unwelcome advances, requests for sexual favors, or other verbal or physical conduct of a sexual nature when

(a) Submission to such conduct is made explicitly or implicitly a term or condition of an individual's employment or status in a course, program, or activity;

(b) Submission to or rejection of such conduct is used as a basis for an employment or educational decision affecting an individual; or

(c) Such conduct has the purpose or effect of unreasonably interfering with an individual's work or educational performance or of creating an intimidating, hostile, or offensive environment for work or learning.

Section 7. Consensual Relationships in the Instructional Context

No faculty member shall have an amorous relationship (consensual or otherwise) with a student who is enrolled in a course being taught by the faculty member or whose academic work (including work as a teaching assistant) is being supervised by the faculty member.

Special Resources at Iowa

RESEARCH ACTIVITIES

The University recognizes that its creative activity is indispensable if its teaching is to have the relevance, freshness, and effectiveness expected of a distinguished institution of higher learning.

The University holds that the term "research" applies to creativity in all fields. Imaginative originality, whether in the fine arts or in the sciences, is of a common character and significance in the overall intellectual life of the institution.

The Office of the Vice President for Research maintains an overview of the many individual research commitments of the institution and actively promotes the research mission of the University in many ways. It

- fosters the development of new knowledge;
- develops and maintains the infrastructure for proper conduct of research;
- helps individuals, groups, and organizational units search out and obtain funds from potential sources in order to enhance the University's education, research, and service missions;
- provides a forum for systematic institutional review of potential major, research-based University initiatives as well as interim management for projects judged worthy of pursuit;
- fosters interdisciplinary and collaborative research and service efforts within and beyond the University to take advantage of funding opportunities;
- identifies high-priority national and state research needs related to the University's mission; disseminates information pertaining to those needs; and assists in development of a University agenda to meet those needs;
- affects federal legislation and regulations enhancing the University's position as a major education and research institution;
- promotes the development of the Oakdale Research Campus in support of the University's research mission;
- stimulates and manages technology transfer of intellectual property to the private sector;
- manages University efforts to improve Iowa's economy;
- promotes the Oakdale Research Park as a vehicle for University/industry interaction.

The Office of the Vice President for Research also maintains a close relationship with the Graduate College because of the college's University-wide character and the vital connection between graduate programs and research and creative activity.

The University Research Council assists the vice president for research in a regular advisory capacity. The council consists of ten faculty members who are widely recognized for their personal involvements in basic research or creative activity, one representative of the University staff, and two student members. Faculty members include two each from the physical, biological, and social sciences and the humanities, and two from the faculty at large. The council gives regular consideration to matters such as the establishment of general policies regarding the University's research and creative efforts, the review of policies and procedures concerned with securing and allocating funds for support of research and creative activity, and additional matters related to the general research and creative functions of the University and the health of basic scholarship on the campus.

Programs

With the advice of the University Research Council and other appropriately involved officers and committees of the University, the Office of the Vice President for Research currently supports the following programs.

Interdisciplinary Research Assistantship Program

Support is available to faculty for hiring graduate student research assistants who help conduct interdisciplinary research in certain contexts. Eligible faculty members include tenure-track investigators involved in interdisciplinary research programs not authorized to award graduate degrees; those engaged in interdisciplinary research who are seeking funds to support research assistants in disciplines different from their own; and those involved in research with one or more faculty members, where the research spans their respective units.

Junior Faculty Research Support

A limited amount of money is available each year from the National Institutes of Health for the support of the initial research efforts of junior faculty (other than those in the colleges of Dentistry, Medicine, and Pharmacy) who want to do health-related research. To qualify, the faculty member must hold a full-time appointment as instructor or assistant professor. The funds may be used for any purpose that will assist the faculty member in conducting an initial exploration of a hypothesis that he or she believes may lead to the development of a full-fledged program of research.

Incidental Grants

Limited funds also are available in the Office of the Vice President for Research for small grants to faculty members to cover the costs of materials, supplies, equipment, proposal writing, and clerical and related assistance for specific research projects; for faculty travel related to specific research projects or for the purpose of acquiring skills, knowledge, or techniques that will enhance research at the University; and for honoraria and expenses of visiting lecturers.

Services

The Office of the Vice President for Research also provides support for several University-wide services required by faculty members engaged in research and creative activities. They include the following.

Central Research Facilities

To maintain state-of-the-art resources for key research activities within the University, selected facilities are identified for centrally supported development. Such facilities are available to all interested graduate students and faculty and on a time-available, fee-for-service basis to those outside the University community. Some financial support is available from the Office of the Vice President for Research for use of the facilities by graduate students. Currently these facilities include the following.

Computer-Assisted Image Analysis Facility

The Image Analysis Facility, located in the Eckstein Medical Research Building, provides instrumentation and technical assistance for research programs involving digital image processing and analysis, three dimensional graphics modeling, molecular modeling, voxel processing, and computer animation.

The facility has two silicon graphics Iris workstations and two Gould IP8500 image processing systems that handle most graphics and imaging applications. Other hardware available includes two MicroVax II minicomputer systems, a Macintosh network, an Eikonix EC 78/99 digital camera, and various mass storage peripherals.

The Iris workstations provide a powerful means to diplay graphic data. There is neovisuals software for creation of real-time, three-dimensional animations and Voxel View software for display of voxel renderings of three-dimensional data sets such as CT and MRI scans.

The facility has the capacity to digitize images from microscopic slides, autoradiograms, photographs, video signals, and video tape. Mass storage peripherals allow for the transfer of images that have been digitized elsewhere. Once digitized, images may be processed in a number of ways, including pseudo-color coding, edge detection, and gray-scale enhancement techniques.

Two full-time staff engineers and one research assistant perform image analysis techniques, develop new image processing and graphics modeling applications, serve as image analysis consultants, train novice or experienced users in the operation of facility systems, and develop new and

customize existing imaging and graphics software.

The facility is well equipped for molecular modeling by computer and has several packages available for use, including Sybyl, Frodo, Quanta and Charm, and Gaussian 85. The facility also offers access to the Cambridge and Brookhaven molecular databases.

Electron Microscopy (EM) Facility

The Electron Microscopy Facility provides instrumentation and technical assistance to research programs involving the use of scanning and transmission electron microscopy, freeze-fracture, and X-ray microanalysis.

Equipment includes the following: a Hitachi S-570 scanning electron microscope equipped with a cryostage, a Microspec WDS wavelength spectrometer, a Kevex EDS system including digital beam control and color mapping, and a backscattered electron detector; a Hitachi S-Y000 Field Emission scanning electron microscope equipped with a Robinson back-scattered electron detector; Hitachi H-600 and H-7000 transmission electron microscopes equipped with STEM and a Kevex X-ray microanalysis system including digital beam control, a Gatan cryostage, electron diffraction, a lanthanum hexaboride electron source, and tilting and rotational specimen holders; a Balzers 301 freeze-fracture/etch apparatus; a Bio-Rad automatic tissue processor; an Autotechnician Tissue Processer; an Emscope critical point drying apparatus; a Bio-Rad critical point dryer; an Emscope sputter coater; an Emscope freeze dryer; a Reichert automatic cryosubstitution apparatus; a Balzers Freeze-Substitution System; four Reichert ultracut-E ultra-microtomes including an FC-4D cryosectioning apparatus; A.O. Parabin microtomes; a Bio-Rad vibrating microtome; a Reichert Cryostat; LKB glass knife makers; diamond knives; a Leitz Diaplan light microscope equipped with brightfield, darkfield, phase, Nomarski DIC, and fluorescence microscopy, as well as 35mm Polaroid and video cameras; other light microscopes; a Gatan ion mill; a Bio-Rad Plasma Asher; a Wescor osometer; centrifuges; balances; ovens; and photographic darkrooms equipped with automatic negative and print processors.

The facility also provides all solutions, supplies, and training necessary for investigations involving microtomy, including specialized staining and embedding techniques, negative staining, metal-coating, autoradiography, cryofixation and cryomicrotomy, enzyme cytochemistry, immunocytochemistry, morphometry and stereology, the preparation of material science samples for both TEM and SEM, including X-ray microanalysis, and other procedures. A library containing texts and reviews on various applications of transmission and scanning electron microscopy also is available.

The facility is intended to serve both experienced and novice investigators and to provide training for those who need it. Alternatively, all or parts of a project can be handled by the facility staff. The facility is available seven days a week, 24 hours a day, on a first-come, first-served basis. It is located in the Eckstein Medical Research Building.

High Field Nuclear Magnetic Resonance (NMR) Facility

Two superconducting spectrometers form the basis for the High Field NMR Facility. The Bruker WM-360 spectrometer operates at 360 MHz, and the Bruker MSL-300 operates at 300 MHz for proton observation. Very high spectral resolution and sensitivity can be achieved for structural determination of complex molecules. Both instruments are fully multinuclear and have variable temperature capabilities. Virtually any multipulse two-dimensional experiment can be performed on the spectrometers.

Both hard disk and floppy disk systems provide data storage. Either digital or standard X-Y plotting is available. Proton NMR spectra are recorded in 5mm tubes. Carbon-13 and other hetronuclear spectra are recorded in 5mm, 10mm, or 20mm tubes. Carbon-13 observation is possible with a combination of proton and either fluorine or phosphorus decoupling. Solid samples can be examined in either the high power or magic-angle spinning modes on the Bruker MSL-300 spectrometer.

Installation of a Bruker AMX-600 spectrometer is scheduled for early 1990.

For the casual user, spectra are recorded by a technician, whereas hands-on use is encouraged for the frequent user after an appropriate training period. The facility is located in the northwest ground floor area of the Chemistry-Botany Building.

High Resolution Mass Spectrometry Facility

The High Resolution Mass Spectrometry Facility, located in the Chemistry-Botany Building, provides the capability for almost any experiment in modern mass spectrometry. Through the utilization of this Facility, information about the molecular weight, elemental composition, and molecular structure of organic, bioorganic, and inorganic molecules can be obtained (to 6000 amu). The most important of these experiments are gas chromatography/mass spectrometry, fast atom bombardment mass spectrometry, and high resolution mass measurement.

Gas chromatography/mass spectrometry (GS/MS) permits the analysis of all components of any complex mixture that can be separated by gas chromatography. This technique is especially useful in research projects that require the analysis of complex samples, such as environmental studies.

Fast atom bombardment mass spectrometry (FABMS) permits the analysis of very large, polar, and/or involatile compounds that cannot usually be studied by other mass spectrometric methods. FABMS is particularly useful for biologically important compounds such as polypeptides, nucleic acids, oligosaccharides, antibiotics, and toxins.

High resolution mass spectrometry (HRMS) provides extremely accurate mass measurements that permit assignment of probable elemental composition for any molecular ion or fragment. Analysis of molecular ions in this manner generally provides better accuracy and requires less sample than any other method of elemental analysis. This technique can be applied even if the sample is impure.

The facility consists of a VG ZAB-HF high resolution mass spectrometer interfaced to a Hewlett-Packard (HP) 5890A capillary GC and a DEC PDP 11/73 data system. The instrument is equipped with positive and negative ion analysis capabilities in the electron impact (EI), chemical ionization (CI), GC-MS, and FAB ionization modes. High resolution mass measurements can be made in all of these modes of operation.

The capabilities of the Mass Spectrometry Facility were substantially expanded in the Spring of 1989 with the addition of two new instruments. The first, a VG TRIO 3 triple quadrupole mass spectrometer interfaced to a Waters 600 MS high-performance liquid chromatograph (HPLC), an HP 5890A GC, and a DEC PDP 11/53 data system, permits LC-MS as well as EI, CI, GC-MS, and FAB experiments. MS/MS techniques used for structure elucidation experiments can be applied in all modes. The second new instrument, a VG TRIO 1 single quadrupole mass spectrometer, is interfaced to an HP 5890A GC and an INTEL 80386/387 computer. The TRIO 1 is available for routine, low resolution EI, CI, and GC-MS experiments. The user-friendly nature of the VG TRIO 1 data system permits hands-on sample analysis after a brief training period.

Large Scale Fermentation Facility

The Large Scale Fermentation Facility, located in the Bowen Science Building, makes possible the large-scale growth and recovery of such microorganisms as yeasts and bacteria.

With its new, sophisticated growth, monitoring, control, and harvesting systems, the facility is one of only four medium or large-scale fermentors in the United States that are able to grow methanogenic bacteria; and it is one of only five or six such facilities able to grow extremely thermophilic bacteria at 70-100 degrees C.

The facility director is available for consultation on medium composition, fermentor conditions, and growth strategies. Further services are provided in areas such as inoculum preparation, medium preparation, sterilization, process initialization, inoculation (growth monitoring if required), and harvesting.

Users can arrange for preliminary pilot studies, gas chromatography, and other relevant technical and scientific services.

Laser Facility

The Laser Facility consists of a wide variety of modern laser instrumentation. In particular, state-of-the-art CW argon ion and krypton ion lasers (with ultraviolet capabilities) are employed, either alone or to pump two tunable dye laser systems throughout the visible and near infrared regions of the spectrum. Each CW Laser is routinely operated single mode with a line width of one ten-thousandth of a reciprocal centimeter. Other CW lasers, including low power argon ion, helium neon, helium cadmium, and Alexandrite (tunable), are also available.

Major pulsed laser systems include a less than or equal to 30 pulse per second Nd:YAG laser system with harmonic generation (2x, 3x, 4x), which pumps two pulsed tunable dye laser systems and includes doubling and Raman shifting capabilities to completely cover the spectrum from vacuum ultraviolet to mid-infrared. An additional pulsed dye laser system can be pumped by a pulsed excimer laser (less than or equal to 100 pulses per second) or a pulsed copper vapor laser. A 300 watt Nd:YAG laser with computer-controlled stage for laser microfabrication applications also is available. In addition, the facility is equipped with a variety of spectroscopic, electronic, optical, and vacuum devices.

This instrumentation is installed in a single large laboratory in the southeast wing of the Chemistry-Botany Building. It includes a mechanically and thermally stable 40-foot-long enclosed optical bench with a variety of workstations for users. Holographic equipment is available in a separate laboratory in the College of Engineering.

A separate Microfabrication Facility in the Chemistry-Botany Building includes a range of materials processing lasers and diagnostic equipment, including a tunable, pulsed multigas laser used predominantly in the infrared; two CW CO2 lasers, one tunable, electrically pulsed 150 watt and one 10.6 micron 400 watt; a 28 watt CW argon ion laser with doubler interfaced with computer-controlled translation and a submicron optical system; electronic probe station; excimer laser; thin film spinner; stylus profilometer; metallurgical microscope; scanning auger microscope; optical monitoring equipment; and several high-speed digital oscilloscopes and computers for experiment control. An ultrafast electronics and photonics facility is being installed on the Oakdale Research Campus. It will include capabilities for studying phenomena with pulsed lasers on a picosecond time scale.

Protein Structure Facility

The Protein Structure Facility provides instrumentation and expertise to assist investigators in all aspects of protein chemistry. The facility is equipped to carry out protein/peptide sequencing, peptide synthesis, and amino acid analysis for compositional information or physiological fluid profiling. Other services such as protein or peptide purification and peptide mapping also are available.

A number of instruments are available for use by investigators and their staff. Included in this group is an automated HPLC, a capillary electrophoresis instrument, a high-sensitivity fluorometer for fluorescence polarization and lifetime measurements, a circular dichroism spectrometer, and a high-resolution uv/visible spectrophotometer. Three stopped flow instruments also are available for studying fast kinetics.

The director and staff are available for consultation on protein purification or analysis and for training users in the operation of facility instruments. Users are encouraged to take an active role in the use of the facility. The Protein Structure Facility is located in the Bowen Science Building.

Social Science Institute

The University of Iowa Social Science Institute (ISSI) is a research and teaching facility that supports the work of faculty and graduate students in a variety of departments on campus. Located in Schaeffer Hall, the institute provides the capability for conducting survey research using a state-of-the-art, computer-assisted telephone interviewing (CATI) system as well as large-scale mail surveys. The CATI hardware system includes a central server computer linked through a local area network to 12 interviewing stations. Features of the CATI software include automatic dialing, automatic execution of complex questionnaire skip patterns and logic branches, call attempt disposition monitoring, and on-line recording of numeric and verbatim responses in machine-readable form.

ISSI also provides training for graduate students interested in techniques of survey methodology. Its professional staff consults with faculty and graduate students as well as clients outside the University.

The institute maintains an extensive Social Science Data Archive and acts as the on-campus representative of the U.S. Census Bureau State Data Center Program, with responsibility for maintaining and providing access to the decennial census data.

The University maintains membership in the Inter-University Consortium for Political and Social Research (ICPSR) through ISSI, enabling members of the University community to obtain a vast array of social science datasets for secondary analysis. The archive presently includes more than 2,000 datasets and continues to grow each year.

ISSI services are available to faculty, staff, and graduate students at the University as well as to the broader state and regional community. In addition to providing access to census and ICPSR data, the institute handles consultation on individual aspects of survey work, such as questionnaire design, data collection, and data analysis. It also may conduct entire surveys, from design through presentation of a final report.

Statistical Consulting Center

The Statistical Consulting Center (SCC), located in MacLean Hall, helps design experiments and surveys, analyze data, and prepare grant proposals. Faculty and advanced graduate students in the Department of Statistics and Actuarial Science provide professional statistical consulting to UI faculty, staff, and students, as well as to the broader state and regional community.

Drop-in consulting services are available free of charge for graduate thesis projects and certain short-term research problems. More extensive consulting is offered on a cost-recovery basis.

Sponsored Programs

Located in Gilmore Hall, the Division of Sponsored Programs maintains a repository of information on federal and nonfederal sources of funding for study and research projects by faculty, staff, and graduate students. The division searches out potential support, helps faculty, staff, and students take advantage of funding opportunities, and matches proposed projects with potentially interested funding agencies. Its staff members specialize in major discipline areas.

The office maintains files on all federal agency programs, complete with proposal guidelines, application forms, regulatory information, and directories of agency staff. Division staff members are well-acquainted with programs and requirements of agencies.

The division's resource center, also located in Gilmore Hall, maintains extensive files on private foundations and corporations that support colleges and universities. Among the many resources of the center are directories of available grants, fellowships, and scholarships; directories aimed at special populations and interests; directories and annual reports of private foundations; and descriptions of nonfederal agencies and foundations with guidelines and application forms for program support. The center maintains its own computerized database of information on more than 1,400 nonfederal programs of interest to University investigators. Customized searches can be performed to determine funding sources for proposed programs.

The division's staff keeps the University research community informed of new

funding opportunities, and changes in program regulations, policies, and perspectives through:

- Individual contact, either by telephone, mailings, or consultation;
- "Research and Graduate News **(rgn)**," published in **fyi**, the University's faculty/staff newsletter;
- Twice-weekly bulletins from the *Commerce Business Daily*, which lists all government requests for proposals (RFPs) and requests for qualifications (RFQs); the division also obtains copies of RFPs in response to special requests from individual researchers; and
- Faculty interest profiles developed through surveys for the purpose of matching opportunities and potential collaborators with faculty members' interests; profiles remain current via periodic updating. Development of proposals, monitoring the progress of projects, and reporting results are important steps in the support process. While much of the responsibility is in the hands of faculty, staff, and students who originate proposals, the division helps make the process work efficiently and effectively.

Sponsored programs staff members guide investigators through the development process and, upon request, help establish budgets, review proposal drafts, prepare technical information, and initiate and maintain contact with funding agencies.

The Division of Sponsored Programs is responsible for interpreting regulations that affect research activities. It has major responsibility for monitoring clearance documentation regarding the use of humans or animals in research. The staff's understanding relevant regulations helps assure full compliance with established rules.

University of Iowa Research Foundation

The University of Iowa Research Foundation (UIRF) was established in 1975. Its primary mission is to provide patent protection for intellectual property and inventions generated at The University of Iowa which might have commerical applications, and to license such property and inventions to industry. When the federal government adopted a uniform government patent policy in 1980, allowing universities to retain ownership of patents based on federally funded research, the process of technology transfer at the University was greatly simplified. Communications between industry and the inventor were enhanced as sponsors of industrial research contracts could be assured the opportunity to license resulting technology from the University, even if federal funding also had been received on the project.

The Office of Technology Liaison was established in the UIRF in January 1988 to help faculty and staff identify marketable technologies. Historically the UIRF had relied primarily on outside agents and firms to promote and license University-generated technologies to industry. Reflecting the University's increased committment to commercialization of its technologies and economic development, the UIRF in July 1989 expanded its activities to include internally controlled marketing and licensing of its technologies to industry.

Upon request, the UIRF provides to industry representatives a summary of all technologies currently or potentially available for licensing, and when appropriate, assists in the exploration of joint-venture or venture capital opportunities from University-generated technologies.

Oakdale Research Campus

The Oakdale Research Campus is administered by the Office of the Vice President for Research. Its 500 acres of land and 51 buildings are located within the corporate limits of Coralville, approximately seven miles northwest of the main University campus. The Oakdale campus is accessible by interstate and multilane divided highways. Approximately 800 researchers, students, patients, staff, tenants, conferees, and visitors use the campus daily.

During the past decade, the campus has evolved from a provider of patient care to a diversified research and educational complex. Most of its programs are subsidiaries or satellite programs of University colleges and major departments. Among these are the Chemical Dependency Center, Dentistry Clinical Practice Management, Institute of Agricultural and Occupational Health, Institute of Child Behavior and Development, Regional Genetic Consultation Services, Iowa Geological Survey, CONDUIT, Iowa Humanities Board, Labor Center, Small Business Development Center, Legislative Extended Assistance Program, Computer Aided Design Software (CADSI), Pediatrics and Physiology Laboratories, and Animal Care Research Facility.

New programs added during the past several years include the Institute of Public Affairs, Iowa Center for the Book, Center for Health Effects of Environmental Contamination, Biomedical Engineering Research, Center for Laser Science and Engineering, Gerontology Program, Iowa Drug Information Service, Iowa Libel Research Program, National Resource Center on Family-Based Services, and Health Protection Office.

Also located on the research campus are the Technology Innovation Center, University House, and the State Hygienic Laboratory, all of which are described in this section of the *Catalog*.

Oakdale Research Park

The University of Iowa's Oakdale Research Park offers businesses engaged in basic and developmental research, product development, and production linked to research and development the opportunity to establish a working relationship with academic researchers.

Located on a 170-acre parcel of land on the Oakdale Research Campus, the park includes a multitenant building designed to meet the needs of growing companies emerging from the Technology Innovation Center, small- or medium-sized research and development firms, and research units of larger, established firms.

The University also leases land at the park to organizations that want to construct and occupy separate facilities. Sites of varying size and prominence are available to meet individual corporate needs.

For more information contact the Office of the Vice President for Research.

Technology Innovation Center

The University of Iowa Technology Innovation Center (TIC) offers a range of services and facilities designed to foster the development of new business ventures—particularly those that make use of advanced technology. Many services at the center are tailored to the needs of entrepreneurs just starting up. However, TIC gladly serves established companies eager to initiate new endeavors.

The strength of the center lies in its ability to couple the scientific and technical capabilities of the University with the expressed needs of the business community. Located on the University's Oakdale Research Campus, TIC provides congenial, inexpensive work space where collaborations between academic scientists and those in business can flourish. It offers ready access to the University's computing facilities, research equipment, and instruments, as well as access to a battery of counseling services on crucial issues such as management, marketing, and finance.

University House

University House, established in 1977, is a place and program dedicated to the support of independent and collaborative scholarship. Occupying 35 offices and meeting rooms in Oakdale Hall on the University's Oakdale Research Campus, University House provides a productive environment where faculty members can work on scholarly tasks and meet in easy interchange. Many University House scholars are supported by University faculty development awards or by grants and fellowships from foundations and federal agencies.

Faculty members in all disciplines and institutions are eligible to request

appointments at University House. University of Iowa professors enjoy the relative seclusion of University House and the opportunity to meet faculty from other disciplines. Visiting professors come to University House to gain easy access to University library resources and to meet University scholars working in related areas of research. Collaborators from different departments and institutions find University House a productive environment.

University House has a particular interest in promoting collaborative efforts. The Interdisciplinary Research Grant program, unique in the nation, supports scholarly projects conducted by two or more University faculty members from different disciplines. University House also frequently sponsors research and curriculum development projects of faculty members from liberal arts colleges in the Midwest, often undertaken in collaboration with University faculty members.

More informal opportunities for collaboration are offered by University House seminars and lunches in the cafeteria.

In addition to promoting faculty development in general, University House seeks to bring together University centers, institutes, committees, and other groups into consortial interdisciplinary arrangements that foster the acquisition of external support for research and educational development.

All scholars at University House are provided with a private office, a personal computer, and secretarial assistance, and have access to conference rooms, a kitchen, and a lounge. Also available in Oakdale Hall are a copy center, cafeteria, and a library book delivery service. Parking is free, as is the frequent Cambus service that connects University House with the main campus. All visiting scholars enjoy full borrowing privileges at University Libraries and access to University recreational facilities.

Center for Biocatalysis and Bioprocessing

The widely recognized work of the University of Iowa Biocatalysis Research Group—the first such group in the United States to focus attention on biocatalysis research—gave rise to the new Center for Biocatalysis and Bioprocessing. The center fosters interdisciplinary, interdepartmental, and intercollegiate research. Its primary aim is to attract industrial attention to the State of Iowa, particularly in the widely applied area of biocatalysis.

Center for Global and Regional Environmental Research

The Center for Global and Regional Environmental Research is being developed to expand current knowledge of the effects and interactions of global change. The center fosters interdisciplinary study of the physical, chemical, and biological processes that influence the earth's changes and trends by bringing together the University's special strengths in the health sciences, biogeochemical cycles, hydrologic and climate systems, and ecological systems and dynamics. It interacts with other University research groups, such as the Public Policy Center.

Center for Health Effects of Environmental Contamination

The Center for Health Effects of Environmental Contamination determines levels of environmental contamination that can be associated specifically with human health effects. The center's activities encompass a wide variety of research involving exposure and risk assessments, including assembling pertinent laboratory data; using data from the existing statewide cancer and birth defect recording systems; developing registries of persons known to be exposed to environmental hazards; developing highly sensitive biomedical assays; performing epidemiologic studies; fostering relationships and ensuring the exchange of information with other teaching institutions or laboratories in the state; implementing programs of professional education and training; and implementing public education programs.

Public Policy Center

The Public Policy Center conducts interdisciplinary research on public policy issues and options in areas such as transportation, environmental quality, health care, and economic growth and development. It helps faculty secure funds for research on public interest topics and organizes symposia on public policy issues.

Research and Development Consortium

Composed of academic and corporate members, The University of Iowa Research and Development Consortium acts in an advisory capacity to the University in the following areas:

- Development of a plan for University participation in Iowa's economic growth;
- Planning for selected technology transfer projects;
- Development of marketing strategies for attracting businesses to the area and the state; and
- Creation of a program to make information about University research readily available to researchers at Iowa State University and the University of Northern Iowa, as well as to those in the private sector. The consortium is part of an interinstitutional network of similar groups at Iowa State University and the University of Northern Iowa.

Office of the State Archaeologist

The Office of the State Archaeologist (OSA) conducts archaeological work that leads to development, dissemination, and preservation of knowledge about Iowa's prehistory and history. OSA is responsible under Iowa statute for discovering, excavating, and preserving archaeological remains in Iowa. Protection of ancient burial sites and human remains is one of its major functions.

The OSA conducts research, educational, and service activities throughout the state and provides consulting services for agencies, municipalities, and firms that need archaeological expertise. Its field work emphasizes archaeological survey and evaluation of development areas, such as new highway corridors, to recover data from threatened sites. It also conducts field schools, teacher workshops, and cooperative research projects with other departments and agencies. Through OSA, University of Iowa students engage in a variety of laboratory and field work.

Staff members of OSA collaborate on research projects with the Departments of Anthropology and Geology and with their colleagues in the Iowa Quaternary Studies Group. Several have adjunct faculty appointments and teach courses in the anthropology department.

OSA resources include more than two thousand accessioned artifact collections from sites around the state; comparative and type collections that aid in identifying archaeological material; extensive archival and document holdings on Iowa archaeology and related subjects; and field equipment that supports large-scale archaeological field work. Members of the University community and the public are welcome to visit the OSA. OSA offices, laboratories, document collection, and artifact repository are presently located in Eastlawn.

Weeg Computing Center

The Gerard P. Weeg Computing Center (WCC), located in the Lindquist Center, provides research and instructional computing facilities to all students, faculty, and staff at The University of Iowa.

WCC maintains systems capable of an extremely wide variety of applications. These facilities are accessible through networked terminals and work stations distributed around the campus.

Weeg's campus and external network connections provide University users with convenient access to national computing and information resources. On behalf of the University, Weeg maintains membership in the CICNET, MIDNET, and BITNET networks.

WCC's Network Services Group offers planning, consulting, installation, and management services for departmental networks. It also provides consulting and management services for campus-wide network-based applications.

WCC's Personal Computing Support Center provides product demonstrations of microcomputer equipment, administers the Faculty/Staff and Student Microcomputer Purchase Programs, and provides hardware and software support to campus microcomputer users.

Personal computers are available for use by University students, faculty, and staff at several Instructional Technology Centers on campus. These are jointly supported by Weeg and by academic and service departments.

Noncredit educational seminars and consultation on general computer use are available on an ongoing basis. Specialized consultation also is provided for equipment and software selection, networking, database, and instructional design applications.

Detailed information on computing facilities and services is available from the WCC Information Center in the Lindquist Center.

Evolutionary Ecology and Behavior

Chair: Stephen Hendrix
Professors: Richard G. Baker (Geology), Robert W. Cruden (Botany), Jeffry T. Schabilion (Botany), Holmes A. Semken (Geology), David Wiemer (Chemistry)
Associate professors: Russell L. Ciochon (Anthropology), Ann B. Budd (Geology), Stephen Hendrix (Botany), Diana Horton (Botany), George Malanson (Geography)
Assistant professor: James Gloer (Chemistry)

Programs and Facilities

The Departments of Biology and Botany offer programs of study leading to the M.S. and Ph.D. degrees with specialization in ecology and evolutionary biology, emphasizing adaptation, population ecology, and community ecology.

Particular strengths of the program are quantitative methods in ecology and evolutionary ecology, plant-animal interactions, population biology, and tropical biology. There is real and strong emphasis on balance between controlled experimentation and field observation. Laboratory research may include controlled breeding experiments in which heritability, behavioral, life history, or other traits are investigated. Field research emphasizes the adaptive significance of traits, interactions between species, and population and community dynamics.

Opportunities for field research are provided locally by the Macbride Nature Recreation Area just outside Iowa City, with lakes, temperate hardwood forests, and old fields. The Iowa Lakeside Laboratory on Lake Okoboji, with year-round laboratory facilities, housing, and a research vessel, provides the opportunity to study undisturbed prairie, marshland, and lake ecosystems.

Field work by faculty and students also takes place worldwide. Recent studies have been conducted in East Africa, England, the Caribbean, Brazil, Mexico, Central America, the Great Smoky Mountains, the Mohave Desert, the American Rocky Mountains, and the Florida Keys. The Smithsonian Institution Laboratory on Barro Colorado Island in Panama and the Parque Nacional de Santa Rosa in Costa Rica are among sites used by staff and students.

The University of Iowa is a member of the Organization for Tropical Studies and regularly sends students to the Tropical Biology Course in Costa Rica. In addition, the University has a cooperative program with the University of the Andes in Merida, Venezuela.

Indoor facilities permit a wide range of studies, with varied equipment for observation and analysis, such as video-recorders, movie cameras, walk-in environment chambers, computer terminals, a GC-MS, and a PDP-12 computer. There is ample space for housing a variety of organisms, and a recently constructed 3,600-square-foot greenhouse provides room for research projects. The botany greenhouse contains a large collection of desert, jungle, aquatic, mesic, and economic flora. The botany herbarium contains more than 200,000 specimens. The Museum of Natural History, an institutional member of the American Association of Systematic Collections, houses more than 900,000 natural science specimens, with birds and mammals particularly well-represented among the vertebrates.

The atmosphere at Iowa is friendly and cooperative and the approach multidisciplinary.

Students may design their graduate programs to take advantage of collaboration, consultation, course work, and cosponsorship opportunities with members of Departments such as Biology, Botany, Chemistry, Computer Science, Geography, Geology, Mathematics, Microbiology, Physiology and Biophysics, and Statistics and Actuarial Science.

Students are encouraged to participate in departmental affairs and may hold positions of responsibility on faculty committees.

Financial Support

All graduate students are offered financial support. Teaching assistantships, research assistantships, tuition scholarships, and predoctoral training fellowships are available. The Bodine Fund assists student travel for study. Postdoctoral students may apply for the Postdoctoral Assistant-in-Instruction Program or the NSP fellowships for students in behavior, and may compete for seed grant money from the University. Computer funds are available for graduate students, postdoctoral researchers, and faculty members.

Iowa Quaternary Studies Group

Professors: Richard G. Baker (Geology), Lon D. Drake (Geology), Brian F. Glenister (Geology), Holmes A. Semken (Geology)
Associate professors: Ann B. Budd (Geology), Russell Ciochon (Anthropology), Diana G. Horton (Botany), George P. Malanson (Geography), Frank H. Weirich (Geography), George G. Woodworth (Statistics)
Assistant professor: Mary Whelan (Anthropology)
Adjunct professors: William Green (Anthropology), George R. Hallberg (Geology)
Adjunct assistant professors: R. Sanders Rhodes (Geology), Donald P. Schwert (Geology)

Program and Facilities

Students working towards master's and doctoral degrees in the Departments of Anthropology, Botany, Geography, Geology, and Statistics and Actuarial Science may develop programs emphasizing some aspect of Quaternary studies. Students with interests in Quaternary studies are encouraged to broaden their programs with courses in these collateral sciences as they progress toward a degree in their chosen fields.

Research by faculty and students includes paleoecological and paleoclimatological studies using pollen, vascular-plant macrofossils, bryophytes, molluscs, insects, and vertebrates; studies of glacial geology, geomorphology, and stratigraphy; fluvial geomorphology, paleohydrology, and stratigraphy; soil stratigraphy and geomorphology; paleo-oceanography of reefs and shorelines; studies in wetland distribution, geography, and ecology; studies of hunter-gatherer societies and their environments; and studies of cultural development and its relation to environmental changes.

Field areas have ranged from the arctic to the tropics, and from the Rocky Mountains across the Great Plains and Central Lowlands to the Caribbean.

Facilities available on campus include both trailer-mounted and hand-operated coring devices, laboratories for sedimentologic analyses, pollen preparation, vertebrate preparation, artifact preparation, X-ray equipment, optical microscopy, and scanning electron microscopy. Both microcomputers and the University's Weeg

Computing Center are accessible to graduate students and faculty.

The Museum of Natural History and individual departments have a number of important reference collections, including the Paleontological Repository (two million specimens including both vertebrates and invertebrates) and the Herbarium (over 200,000 specimens of vascular plants and about 45,000 specimens of bryophytes). The Office of the State Archeologist houses the State Archeological Repository, with over half a million specimens. Other specialized collections of more than 2,000 seeds and fruits and more than 1,600 pollen types are available in the geology department.

Departmental branches of the library have extensive holdings of books and journals in the botany, biology, and geology departments, and the Office of the State Archeologist has a library as well.

Students may design programs that result in a degree from one of the cooperating departments but that involve considerable course work, research, and consultation with one or more other departments. A weekly seminar, the Quaternary Brown Bag, provides a forum for discussion of research topics in Quaternary studies.

Financial Support

Teaching and research assistantships are available on a competitive basis from each of the departments involved. Space and facilities are available for postdoctoral students. Some funding is available from individual departments for field expenses. Computer funds are available for graduate students, postdoctoral students, and faculty.

For further information, write directly to the Departments of Anthropology, Botany, Geography, Geology, or Statistics and Actuarial Science, or to the director of the Department of Geology.

Related Units

Although not directly connected with the Office of the Vice President for Research, these units have a special role in the conduct of research at the University.

Institutes

Dows Institute for Dental Research
Contact the College of Dentistry for information.

Financial Markets Institute
Contact the College of Business Administration for information.

Industrial Relations Institute
See the College of Business Administration section of the *Catalog*.

Institute for Economic Research
See the College of Business Administration section of the *Catalog*.

Institute for Insurance Education and Research
See the College of Business Administration section of the *Catalog*.

Institute of Agricultural and Occupational Health
See "Preventive Medicine and Environmental Health" in the College of Medicine section of the *Catalog*.

Institute of Hydraulic Research
See the College of Engineering section of the *Catalog*.

Institute of Public Affairs
See the Continuing Education section of the *Catalog*.

Ira B. McGladrey Institute of Accounting Research
Contact the Department of Accounting in the College of Business Administration for information.

Centers

Alzheimer's Disease Research Center
Contact the College of Medicine for information.

Asthma and Allergic Diseases Center
Contact the College of Medicine for information.

Cancer Center
See the College of Medicine section of the *Catalog*.

Cardiovascular Research Center
See the College of Medicine section of the *Catalog*.

Center for Health Services Research
See the College of Medicine section of the *Catalog*.

Center for International and Comparative Studies
See the Graduate College section of the *Catalog*.

Center for Laser Science and Engineering
Contact the Graduate College for information.

Center for Materials Research
Contact the Department of Biomedical Engineering in the College of Engineering for information.

Center for New Music
See "Music" in the College of Liberal Arts section of the *Catalog*.

Center for the Book
Contact the Office of the Associate Vice President for Cultural Affairs for information.

Center for the Study of Recent History of the United States
Contact the Department of History in the College of Liberal Arts for information.

Centers for Computer Aided Engineering
See the College of Engineering section of the *Catalog*.

Cleft Palate Research Center
Contact the College of Medicine for information.

Clinical Research Center
See the College of Medicine section of the *Catalog*.

Cochlear Implant Research Center
Contact the College of Medicine for information.

Comparative Legislative Research Center
See "Political Science" in the College of Liberal Arts section of the *Catalog*.

Connie Belin National Center for Gifted Education
Contact the College of Education for information.

Core Center: Diabetes and Endocrinology
See the College of Medicine section of the *Catalog*.

Craniofacial Anomalies Research Center
Contact the College of Medicine for information.

Cystic Fibrosis Research Center
Contact the College of Medicine for information.

Digestive Disease Core Center
Contact the College of Medicine for information.

Iowa Center for Communication Study
See "Journalism and Mass Communication" in the College of Liberal Arts section of the *Catalog*.

Iowa Geriatric Education Center
Contact the College of Medicine for information.

Iowa Urban Community Research Center
See "Sociology" in the College of Liberal Arts section of the *Catalog*.

Manufacturing Productivity Center
Contact the College of Business Administration for information.

Mental Health Clinical Research Center
Contact the College of Medicine for information.

Midwest AIDS Training and Education Center
Contact the College of Medicine for information.

National Maternal and Child Health Resource Center
Contact the College of Law for information.

National Resource Center on Family Based Services
Contact the School of Social Work in the College of Liberal Arts for information.

Oral and Maxillofacial Implant Center
Contact the College of Medicine for information.

Science Education Center
Contact the College of Education for information.

Small Business Development Center
Contact the College of Business Administration for information.

Laboratories

Iowa Lakeside Laboratory
See "Iowa Lakeside Laboratory" in the *Catalog.*

Orthopaedic Biomechanics Laboratory
Contact the College of Medicine for information.

Translation Laboratory
Contact the Division of Continuing Education for information.

Others

Birth Defects and Genetic Disorders Unit
Contact the College of Medicine for information.

Collaborative Studies of Affective Disorders
Contact the Department of Psychiatry in the College of Medicine for information.

Diabetes Control and Complications Trial
Contact the College of Medicine for information.

Gerontology Programs
Contact the School of Social Work in the College of Liberal Arts for information.

Iowa Testing Programs
See the College of Education section of the *Catalog.*

Molecular Biology of Tumor Cells
Contact the College of Medicine for information.

Pharmaceutical Services
Contact the College of Pharmacy for information.

Project on Rhetoric of Inquiry (POROI)
See "Project on Rhetoric of Inquiry" in this section of the *Catalog.*

IOWA LAKESIDE LABORATORY

The Iowa Lakeside Laboratory, a field station for the biological and physical sciences on Lake Okoboji, Iowa, is the site of a cooperative program in teaching and research carried on under the auspices of Iowa State University, The University of Northern Iowa, and The University of Iowa. Two terms of five weeks each are held during June, July, and August. Facilities for year-round research are available. (See listing for "Iowa Lakeside Laboratory" in the College of Liberal Arts section of the *Catalog.*)

PROJECT ON RHETORIC OF INQUIRY

Project codirectors: Donald N. McCloskey, John S. Nelson

The Project on Rhetoric of Inquiry (POROI) involves students and faculty from across the campus in studies of rhetoric throughout scholarship and culture. POROI regards rhetoric in its ancient sense, as the whole art of argument. Its purpose is to improve persuasion in the arts, humanities, sciences, and professions.

POROI's executive committee coordinates the project initiatives, working with faculty in University of Iowa colleges. In addition, an international board of distinguished scholars advises the committee about its programs, which include the Faculty Rhetoric Seminar, conferences and symposia, publications, and fellowships for Iowa participants and visitors.

The biweekly Rhetoric Seminar was founded in 1980 by a small group of Iowa faculty. The group grew to include some one hundred colleagues, who participate in a year-round interdisciplinary seminar and other seminars in philosophy and engineering. Before each seminar, POROI distributes discussion papers to faculty from many University of Iowa departments and from other colleges in Iowa.

The National Endowment for the Humanities has funded a series of five workshops for 1990-1992, and other workshops are planned on topics as varied as statistical theory and academic innovation.

POROI directs two book series, from The University of Wisconsin Press (some 15 volumes in print) and the University of Chicago Press.

The project also sponsors lectures and research projects by local and visiting faculty. Iowa faculty associated with POROI's various programs teach both undergraduate and graduate courses inspired by rhetoric of inquiry. A graduate certificate program is being planned. More information, including semester course lists, is available from the Office of the Project on Rhetoric of Inquiry.

UNIVERSITY LIBRARIES

University librarian: Sheila D.Creth
Directors: Barbara I. Dewey, Wayne Rawley, C. Edward Shreeves
Facilities and budget: William C. Sayre
Acquisitions: Kathleen B. Wachel, *head;* Elizabeth A. Ford, Rijn A. Templeton
Bibliographers: Christine Africa, John Bruce Howell, Catherine Larson
University conservator: Pamela Spitzmueller
Cataloging: David A. Aamodt, John J. Dodd, Grace A. Fitzgerald, Lawrence R. Gorman, Judith K. Doorenbos, Karl K. Kahler, Selina S. Lin, Bonnie S. Mitch, Mary E. Monson, George P. Mullally, Mary E. Noble, Timothy R. Shipe
Circulation: Susan Marks, *head;* Margaret Richardson, *browsing room librarian and reserved books librarian*
Government publications: Carolyn W. Kohler, *head;* Frank T. Allen, Mary R. McInroy
Reference: Marsha A. Forys, David D. Hudson, Rebecca L. Johnson, James J. Julich, Lucia A. Marino, Keith A. Rageth, Helen B. Ryan, John N. Schacht, Janice Simmons-Welburn
Serials: Ruth E. Christ, Mary Hubbard, Charlene E. Lehman, Marjorie G. Wilhite
Special collections: Robert A. McCown, *head;* Richard M. Kolbet, Earl M. Rogers, David E. Schoonover
Departmental libraries: Harlan L. Sifford, *art;* Stephen Macksey, *botany-chemistry and biology;* J. David Martin, Peter J. Hartford, *business administration;* John W. Forys, Jr., *engineering;* Richard S. Green, Louise S. Zipp, *geology and maps;* Sandra S. Ballasch, Hope I. Barton, David S. Curry, Richard Eimas, Edwin A. Holtum, Eric T. Rumsey, Diana Spence, *health sciences;* Christine Kerckhove, *mathematics;* Joan O. Falconer, *music;* Dorothy M. Persson, *psychology and physics*
Special services: William Welburn

The University's Main Library and its 11 departmental libraries, plus the Law Library, contain more than 3 million volumes. Departmental library holdings are: art, 72,000 volumes; biology, 37,000; business administration, 24,000; chemistry-botany, 77,000; engineering, 86,000; geology, 44,000; mathematics, 44,000; music, 74,000; physics, 43,000; and psychology, 52,000.

The Hardin Library for the Health Sciences contains 222,000 volumes, and the Law Library, administered by the College of Law, contains 484,000.

Special Resources

With more than 3 million volumes, the libraries at The University of Iowa make up the largest library system in Iowa. Among 106 university research libraries in the United States and Canada, the system ranks twenty-eight in number of volumes held and twenty-third in expenditures for library materials.

The Main Library, its 11 departmental libraries, and the Law Library occupy more than 11 acres of space, provided seating for more than 7,000 users, and have more than 70 miles of shelving for collections.

Recent statistics show that library staff annually check out nearly 1 million items to faculty, staff, and students; record 1.25 million in-building uses of library books and other materials; and answer nearly 150,000 questions.

University Libraries has recently embarked on a comprehensive user education program to provide information on its resources and services and instruction in their use. In 1988, more than 3,200 people participated in programs such as subject-based faculty/graduate seminars, course-related instruction, OASIS training, and reference consultations. Special programs included workshops for international students, programs for debaters in the Iowa National Summer Institute in Forensics, and programs on

library use for student athletes. The Hardin Library for the Health Sciences provides Medline training for individuals who want to do their own computer searches.

In addition its holdings of bound volumes and access to numerous electronic databases, the libraries provide some 4 million microforms (microfilm, microcards, and microprint and microfiche sheets) as well as various other formats, including maps, video recordings, and sound recordings. Also available are information resources in compact disc format, six CD-ROM computerized indexes. Students and faculty can do computer searches on a wide variety of topics. Customized online database searching is available by appointment.

The Main Library serves as the principal repository for the social sciences and the humanities. Located within this building are various special collections. The Government Publications Department holds nearly 1 million printed pieces and more than 1 million microformated items. As a full U.S. Government Depository Library, it automatically receives thousands of items published by the federal government. This department is also a state of Iowa depository, a European Communities (Common Market) depository, and a United Nations depository. The Map Collection contains over 150,000 sheet maps and 100,000 aerial photographs.

and 10,000 cataloged manuscript letters. This department also manages the University Archives. The materials within the Special Collections Department cover a wide range of subjects, including works on the culinary arts, a major collection of Lincoln material, a rare collection of the history of hydraulics, and a large collection of railroadiana.

The Health Sciences Library houses a special collection of rare and classic medical works in the John Martin Rare Book Room, named after the principal donor of the some 2,500 volumes in the collection. Martin, a retired neurosurgeon from Clarinda, Iowa, continues to add to this world-famous collection.

The University Libraries and the Law Library have implemented an automated library catalog and attendant subsystems. The online catalog, OASIS, contains some 900,000 records representing approximately 60 percent of the cataloged collections of the libraries.

Known as OASIS (Online Access System for Information Sources), this system greatly enhances teaching and research at Iowa. When the system is fully implemented, faculty and students will have a sophisticated tool for accessing information on library materials. From one database, the library user will be able to determine whether an item has been ordered, if it is awaiting cataloging, or whether it is in circulation, on reserve, or otherwise unavailable for check out. The University telecommunications network makes much of this information available from terminals in the libraries and from laboratories, offices, dormitories, and homes.

Traditionally, the strength of a library system has been based primarily on the number of volumes it held. Because of the substantial, seemingly geometric growth in recorded information, and because of dwindling resources available to acquire this information, it is expected that an increasingly important measure of library effectiveness will be the staff's ability to identify ownership of material not held locally and to borrow that material in a timely fashion.

The University of Iowa Libraries is a member of several consortiums: the Research Libraries Group; the Iowa Computer-Assisted Network; the National Library of Medicine's Regional Medical Library Network; and a resource-sharing network for the CIC institutions (the Big Ten and the University of Chicago). Through these organizations, and especially through the Research Libraries Group, faculty and students at Iowa have gained greatly increased access to materials held at other institutions.

THE UNIVERSITY OF IOWA HEALTH CENTER

The University of Iowa plays a major role in the preparation of health professionals for Iowa and the nation. In its health center are found the academic programs, clinical facilities, and service agencies to prepare students and practitioners to serve a wide spectrum of human health needs—ranging from basic first aid to the most advanced diagnostic and treatment procedures—and to search for entirely new knowledge.

As soon as they have acquired basic knowledge in their fields, health profession students begin to learn by doing, following the examples and directions of skilled practitioners who teach while providing health care for thousands of patients from the community, state, and region. The University of Iowa Health Center thus is simultaneously a center of learning and of service. It is one of the most advanced, comprehensive health science centers in the United States.

It shares many skills off campus through cooperative programs with other Iowa colleges and community colleges and through a variety of continuing education programs for health practitioners—many of whom also come to the Iowa campus to update their knowledge through conferences, clinics, and refreshers.

Programs, faculties, and courses of the colleges of Dentistry, Medicine, Nursing, and Pharmacy are described in other sections of the *Catalog*. Other health center units and related programs are described below.

The University of Iowa Hospitals and Clinics

Director and assistant to the president for statewide health services: John W. Colloton
Administrator: William D. Petasnick
Deputy administrator: John H. Staley
Senior assistant directors: William W. Hesson, William D. Stoddard
Assistant directors: Brandt Echternacht, Gary S. Levitz
Executive assistant to the director: Amy B. O'Deen
Assistants to the director: Alan J. Burgener, Gerhild I. Krapf, Cynthia S. Wickstrom
Administrative associate: Theodore J. Yank
Director, Financial Management and Control: Kenneth H. Yerington
Director, Information Services: Eldean A. Borg
Clinical service heads: *Anesthesia,* John H. Tinker; *Hospital Dentistry,* Robert A.J. Olson; *Dermatology,* John S. Strauss; *Family Practice,* Charles E. Driscoll; *Internal Medicine,* Francois Abboud; *Neurology,* Antonio R. Damasio; *Obstetrics and Gynecology,* Jennifer Niebyl; *Ophthalmology,* Thomas A. Weingeist; *Orthopaedics,* Reginald Cooper; *Otolaryngology and Maxillofacial Surgery,* Brian McCabe; *Pathology,* Richard G. Lynch; *Pediatrics,* Frank H. Morriss; *Psychiatry,* George Winokur; *Radiology,* Edmund A. Franken; *Surgery,* Robert J. Corry; *Urology,* Richard D. Williams

The University of Iowa Hospitals and Clinics is the largest university-owned teaching hospital in the nation. It provides the clinical base of graduate and undergraduate studies for approximately 2,380 students in 35 disciplines, including medicine, dentistry, nursing, pharmacy, hospital administration, physical therapy, vocational training, pastoral studies, and social work.

University Hospitals and Clinics sponsors residency programs in which more than 600 physicians, dentists, and pharmacists gain advanced clinical knowledge and skills in the health care specialties they have chosen to pursue.

The 902 beds in the hospital complex accommodate some 34,000 admissions annually, and 157 specialty clinics accommodate another 425,000 ambulatory patients. More than 15,000 major surgical procedures are performed annually in the hospitals' 21 major operating rooms, and approximately 2,000 infants are born at University hospitals each year.

Highly specialized health services—for example, burn care, cardiac care, neonatal intensive care, and advanced technology for diagnosis and treatment—are easily accessible to Iowans who reside in communities without such resources. The hospitals' transportation fleet of 15 vehicles travels more than one million passenger-miles each year, transporting approximately 10,000 Iowans. The Air-Care Emergency Helicopter Service carries specially trained medical and nursing teams to aid the most critically ill and injured and to transport them to the hospital for treatment. Many Iowans owe their lives to this service alone.

About 7,200 hospital staff members provide professional and support services needed

to care for approximately 2,200 patients each day. The hospitals' clinical staff includes 515 faculty physicians and dentists, and the house staff numbers 615 resident and fellow physicians and dentists. The hospitals' Department of Nursing is staffed by more than 1,500 professional nurses.

Other hospital staff members annually provide more than 200,000 X-ray examinations and treatments, conduct nearly 5 million laboratory tests, fill more than 2.5 million prescription orders, provide more than 65,000 physical therapy treatments, and prepare more than 33,000 blood and component transfusions.

Recent modernization provided new intensive care, cardiology, cornea center, and urology units. The seven-story, Boyd Tower addition went into service in 1976, providing expanded and replacement facilities for a variety of inpatient and outpatient services. The Roy J. Carver Pavilion, named in recognition of a gift from the late Muscatine industrialist, provides facilities for a multispecialty trauma and emergency treatment center; physical therapy department; orthopaedic, urology, and neurology inpatient units, clinics, and faculty offices; surgery and internal medicine inpatient units; cardiology and psychiatry clinics; and laboratories of the Department of Pathology.

The John W. Colloton Pavilion—named for the hospitals' current director—opened in 1982. It consolidates services of the Department of Pediatrics in the Iowa Children's Health Care Center and provides clinic and faculty offices for the Department of Surgery. The Colloton Pavilion also houses a new burn center, digestive diseases center, cardiac care center, and ambulatory surgery center.

In 1989, a Patient and Visitor Activities Center, including a library, medical museum, and lounge accommodations, began services. A phase of the Colloton Pavilion currently under construction will provide new surgical suites.

The John Pappajohn Pavilion, currently under construction, will provide adult and child psychiatric care accommodations as well as a sports medicine clinic, a spine diagnostic and treatment center, and a hand service. The new building will also house the John and Mary Pappajohn Clinical Cancer Center, with ambulatory patient clinics and inpatient accommodations for some 275 cancer patients daily.

Clinical departments of University Hospitals and Clinics collaborate in conducting accredited health professional education programs in dietetics, radiologic technology, medical technology, nuclear medicine technology, hospital pharmacy, physical therapy, physician's assistantship, and cytotechnology. University Hospitals and Clinics also provides supervised clinical settings for Kirkwood Community College programs in nursing education, orthopaedic physician's assistance, operating room technology, and respiratory therapy.

Of the programs cited above, those conducted through collaboration of the hospitals and the colleges of Medicine and Nursing are described in the appropriate college sections of the *Catalog*. The following courses are conducted exclusively by University Hospitals and Clinics staff.

000:901 Radiologic Technology Program 0-1 s.h.
Twenty-four consecutive months; eight hours a week in courses including radiographic positioning, film critique, medical terminology, radiologic physics, anatomy and physiology, radiographic technique, computer technology, radiation biology, radiographic processing, radiographic equipment, and quality assurance; 32 hours a week in supervised clinical education; national certification examination required at completion of course.

000:902 Orthoptics Program 0 s.h.
Clinical science of binocular vision, ocular motility, and related disorders of the eye; practical and theoretical training in the Department of Ophthalmology; written and oral practical national board examinations required at end of 24 months of training.

000:903 Radiation Therapy Technique 0 s.h.
Theory and techniques of radiation therapy technology; emphasis on areas of treatment planning, dosimetry, and use of radiation-producing equipment to administer treatment; one-year program; national certification examination required at completion of course. Prerequisite: radiologic technology program.

000:904 Ultrasound Technology Program 0 s.h.
Principles and methods in utilizing ultrasound as an imaging modality; specialties include abdominal, obstetrical, gynecological, and neonatal brain ultrasonography; echo cardiology, one-year program; national certification examination required at completion of course. Prerequisite: radiologic technology program.

000:905 Ultrasound Technology Clinical Course 0 s.h.

000:906 Magnetic Resonance Imaging Technology arr.
Six-month program; computer technology, physics, cross-sectional anatomy, instrumentation, clinical imaging. Prerequisite: radiologic technology program.

000:907 Magnetic Resonance Imaging Clinical arr.

Council on Speech Pathology and Audiology

The council coordinates clinical services and training in speech-language pathology and audiology offered by The University of Iowa Hospitals and Clinics (Division of Developmental Disabilities, Department of Pediatrics, Child Health Specialty Clinics, Department of Psychiatry—Child Psychiatry Service, Department of Otolaryngology—Head and Neck Surgery, Department of Neurology); the Veterans Affairs Medical Center in Iowa City; and the Department of Speech Pathology and Audiology.

Dental Health Bureau

The Dental Health Bureau is sponsored jointly by the Iowa Department of Public Health, which provides personnel, salaries, and office supplies, and the University, which provides space and equipment.

The bureau's primary purpose is to promote a program of dental health education and disease prevention in the public and parochial schools of the state. Senior dental hygiene students from the University conduct team programs with the public health dental hygienists of the Iowa Department of Public Health. These programs include instruction in oral hygiene, good dental health practices, a fluoride rinse program, and nutrition as related to dental health. The bureau also supplies dental referral cards to schools to remind parents of the need for regular dental care for children.

Dental Service

The College of Dentistry Dental Clinics provide comprehensive dental care in conjunction with dental education and research. Private care by faculty and graduate students is available in addition to clinic care. Anyone, including employees and students at the University, may receive dental treatment at the college. However, the College of Dentistry is not affiliated with the University Student Health Service and does not render service under the student health hospitalization fund.

The Dental Clinics operate on a fee-for-service basis payable at each visit. Payment can be made by cash, check, or credit card. Because clinic treatment takes longer than private treatment, the patient's contribution in time is appreciated, and the fees have been adjusted downward accordingly.

Health Occupations Education

Through this program, the University collaborates with the State Department of Education to provide consulting and advisory services, educate teachers, conduct research, and develop curricula and instructional material for health occupations programs conducted for the most part by Iowa's 15 area community colleges, but also by a growing number of high schools. The Health Occupations Education staff also assists these institutions in their increasingly important role in conducting continuing education.

Hardin Library for the Health Sciences

The Hardin Library for the Health Sciences serves the combined information and research needs of the colleges of Dentistry, Medicine, Nursing, and Pharmacy; the Graduate Program in Hospital and Health Administration; and the Department of Speech Pathology and Audiology. The largest of the departmental libraries in the University library system, the Hardin library contains more than 220,000 volumes and receives more than 2,200 periodicals. In addition to providing ample space for these collections, the interior allows for enough reading and study space to accommodate approximately 1,100 people. Special features of the library range from computerized access to the latest health sciences literature, via self-service terminals and librarian-mediated searches of

MEDLINE and other databases, to the rare books (some dating back to the fifteenth century) in the John Martin Rare Book Room.

As part of The University of Iowa library system, the Hardin library uses the OASIS automated library system. All materials acquired since 1980 are cataloged in OASIS, as are all current periodicals and many items still being processed for collections.

Oakdale Campus

Located seven miles northwest of Iowa City, the 500-acre Oakdale campus includes health-related community programs such as the Chemical Dependency Center, National Resource Center on Family Based Services, Dentistry Clinical Practice Management, Institute of Agricultural and Occupational Health, Institute of Child Behavior and Development, Regional Genetic Consultation Services, Specialized Child Health Services program, and the University Hygienic Laboratory.

Other health-related programs on the Oakdale campus are Continuing Nursing Education; Southeast Iowa Emergency Medical Services Center; Gerontology Center; dental research; physiology laboratories; Animal Care Research Facility; Air-Care Helicopter Service hangar and pad; Center for Health Effects of Environmental Contamination; and bioengineering research.

University House provides office space and related support for faculty members engaged in research or curriculum development.

The Oakdale Campus is administered by the Office of the Vice President for Research. For more information, see "Research Activities" in this section of the *Catalog*.

Ronald McDonald House

In July 1985, a 16-bedroom Ronald McDonald House was opened to provide living quarters for families of seriously ill children who receive medical treatment at The University of Iowa Hospitals and Clinics or at Mercy Hospital in Iowa City. Many of these children and their families must travel long distances from their homes. To help make these families' time here easier, a group of parents, volunteers, University Hospitals staff members, and McDonald's restaurant owners established the Children's Family Living Foundation, a not-for-profit corporation. The corporation helped plan and raise funds for the house, and leases from the University the wooded land on which the house was built.

University (State) Hygienic Laboratory

As the state of Iowa's environmental and public health laboratory, the University Hygienic Laboratory offers diagnostic, surveillance, analytic, training, and consulting services in bacteriology, immunology, parasitology, industrial hygiene, serology, virology, toxicology, health physics, mycology, and radiation chemistry. It provides complete laboratory program support to the State Department of Health; Bureau of Labor; Department of Water, Air, and Waste Management; and State Geological Survey.

In the environmental area, the laboratory provides a wide variety of services related to water, wastewater, hazardous waste, and air quality monitoring and analyses; pesticide and herbicide analyses; mineral and metal analyses.

The Hygienic Laboratory serves as Iowa's primary laboratory for drinking water analyses and is one of only 35 laboratories in the nation certified to perform analyses for hazardous waste sites under the USEPA Superfund Program. It is an accredited industrial hygiene laboratory and holds an interstate license for the diagnostic services involved in blood lead screening and screening for inborn metabolic errors in the newborn and for the AIDS virus.

Within The University of Iowa, the Hygienic Laboratory provides instruction and training in diagnostic microbiology and virology as part of regular academic courses, as well as in environmental engineering studies. In addition, the Hygienic Laboratory provides classroom and individual bench training to University students and to laboratory and medical personnel interested in learning specific laboratory procedures. Laboratory staff members also are available to University faculty, health care staff, and students for technical consultation.

Specialized Child Health Services

The Iowa Specialized Child Health Services is an organization that administers several statewide health services for children. Among these are the Genetic Consultation Service, Coronary Disease Prevention Program, Cystic Fibrosis Program, Childhood Cancer Diagnostic and Treatment Program, Rural Comprehensive Care Program for Hemophilia Patients, Statewide Perinatal Care Program, Iowa Newborn Screening Program, Community Child Health Center Program, and a program of Regional Child Health Specialty Clinics.

At Regional Child Health Specialty Clinics (CHSC) conducted in communities throughout the state, Iowa residents are provided with diagnosis and evaluation services in pediatrics, orthopaedics, otolaryngology, speech pathology, audiology, physical therapy, nutrition, and clinical and educational psychology. CHSC also supplements a University of Iowa graduate training program in audiology and speech pathology and provides monitoring and follow-up services on special health problems related to handicaps such as muscular dystrophy, mental retardation, phenylketonuria, and hemophilia.

University Hospital School

A University-affiliated program that deals with the problems of developmentally disabled children and young adults, the University Hospital School serves as the focus of activity for the Division of Developmental Disabilities within the Department of Pediatrics. It is an integral part of the tertiary-level health services available through The University of Iowa Hospitals and Clinics.

The interdisciplinary team approach provides services involving the fields of medicine, dentistry, nursing, nutrition, speech and audiology, physical and occupational therapy, recreational therapy, psychology, social work, special education, and prevocational and vocational activities.

Outpatient services provide comprehensive evaluation and follow-up of infants, children, and young adults who have problems and/or disabilities that affect their development. Programs of education and therapy are planned in conjunction with the patient, when appropriate, and with the parents and community-based service providers. The outpatient services include a number of special clinics (Child Development Clinic, Meningomyelocele Clinic, Metabolic Disorders Management Clinic, Infant and Young Child Clinic, Child and Young Adult Clinic) in which specially trained staff address specific problems.

Infants, children, and young adults may be admitted to the inpatient unit as a result of recommendations from one of the outpatient services. Short-term admissions are for relatively specific goals that can best be accomplished on an inpatient basis. The staff coordinates educational services with the child's local school system in order to maintain continuity of services while the children are in this unit.

Training activities include pre- and in-service lectures, workshops, practicums, and seminars for a variety of care providers working in other facilities or community programs. These activities take place in the University and community setting.

University Hospital School cooperates closely with the state Developmental Disabilities Council and other state agencies to provide training and technical assistance to those programs.

Laboratories of the divisions of genetics and biochemistry of the Department of Pediatrics are used extensively in University Hospital School research, training, and service programs.

Wendell Johnson Speech and Hearing Clinic

Located in the Wendell Johnson Speech and Hearing Center, the clinic provides evaluations and consultation for individuals with speech, language, or hearing problems; habilitation or rehabilitation programs for persons who can come to the clinic for such service; a summer residential program for children with speech, language, hearing, and reading problems; and clinical practicum training for students in speech-language pathology and audiology. Any University of Iowa student may receive services without charge. Products (e.g., hearing aid supplies and accessories), devices (e.g., hearing aids), and hearing aid repair services are provided to University of Iowa students at cost plus handling expenses. Services include diagnostic examinations, consultations, individual and small-group sessions, hearing aid services, and referrals to other clinics as needed.

Veterans Affairs Medical Center

Medical students and residents receive much of their clinical training in this 327-bed medical center, a comprehensive health care facility in Iowa City. Veterans Affairs Medical Center facilities utilized by The University of Iowa Health Center include, but are not limited to, laboratories for the transplantation program, highly specialized laboratories in nuclear medicine, and special units for the study of metabolic and gastrointestinal diseases. The Veterans Affairs Medical Center, which is closely affiliated with all four University health science colleges, offers unique training opportunities in clinical pharmacology, gastroenterology, cardiology, nephrology, oncology, and applied immunology.

THE IOWA CENTER FOR THE ARTS

Located along the west bank of the Iowa River on The University of Iowa campus, the Iowa Center for the Arts is a major cultural resource not only for the University community, but for the people of the state and region. The center, which celebrated its 50th anniversary in 1985-86, realizes a University dream of many generations: to bring the arts together in a single campus setting, near the geographical heart of the University.

The arts center facilities include many of the academic arts units in the College of Liberal Arts, together with performance and exhibit spaces in the Theatre Building, Music Building, School of Art and Art History, the Museum of Art, and Hancher Auditorium, the center's largest performing arts showcase.

In addition to activities housed in these facilities, various educational programs in other parts of the arts campus reflect the University's strong commitment to artistic creativity.

Financial support from many sources, both public and private, is reflected in the physical structures and educational/cultural offerings of the Iowa Center for the Arts. In addition to resources from the state of Iowa and the federal government, private contributions from growing numbers of corporate and individual patrons play an important role in the quality and diversity of the center's services to the people of Iowa and the surrounding region.

School of Art and Art History

The University of Iowa School of Art and Art History has been a pioneering force for art in America for more than half a century. The original art building dates from 1936. Major additions were added in 1968-69, greatly extending classroom and studio space and providing a new wing for ceramics, metalsmithing, and sculpture.

A small gallery within the building, used primarily for the display of works by students and visiting artists, is named for artist Eve Drewelowe, who in 1924 became the first recipient of the Master of Arts degree in studio art at The University of Iowa.

The school's Corroboree Gallery, multimedia studios, and video art studio are located in the International Center. New and experimental works are presented through exhibitions, lectures, live cablecasts, and performances that emphasize new concepts and directions in contemporary arts. Visiting artists and critics bring a wide range of ideas to students and visitors.

Museum of Art

As one of the two largest art museums in Iowa and the major art institution supported by the state, The University of Iowa Museum of Art (UIMA) recognizes its responsibility to serve a varied state-wide audience. Although its primary constituency is the University community, the museum's reputation and growing permanent collection attract a national and international audience as well as adults and young people from across the state.

The UIMA collection of more than 8,000 objects has three notable strengths: late nineteenth- and twentieth-century European and American painting and sculpture, works on paper, and African art. Paintings and sculptures number some 660, including Pollock's *Mural*, Beckmann's *Karneval*, and Miro's 1939 *A Drop of Dew Falling from the Wings of a Bird*, and sculptures by Arneson, Nevelson, Lipschitz, Moore, Noguchi, Rickey, and Rodin. The museum's 4,000 prints include impressions by Whistler, Cassatt, Rembrandt, Manet, Toulouse-Lautrec, and Goya; its collection of drawings represents artists from Boucher to Rothko.

The Stanley Collection, which features more than 500 examples of art from west, central, and east Africa, represents the entire sub-Saharan continent. A gift of the late Betty and Max Stanley of Muscatine, it is one of the most prized collections of the museum.

Secondary categories of the museum's permanent collection include 375 pieces of European and American silver; 300 American contemporary ceramics; 400 nineteenth- and twentieth-century photographs; 20 Oceanic, 900 Meso-American, and 100 Native American objects; and a small but significant collection of Etruscan art.

The museum presents an average of 15 special exhibitions per year as well as continuous rotation of the permanent collection. At any one time, the galleries provide a variety of exhibition and educational experiences for visitors of all ages offering shows that range from the scholarly and esoteric to the popular.

Museum special events include slide-lectures by visiting artists, scholars, and collectors; "Music in the Museum," a Sunday afternoon concert series; and "Perspectives," a weekly program of performances, demonstrations, discussions, and debates. Museum docents lead groups on guided tours of the museum's exhibitions, and catalogs of many exhibitions are available for purchase. Friends of the Museum of Art, a private support group, sponsors receptions, openings of exhibitions, and active print, drawing, and ethnographic study clubs.

The University of Iowa Museum of Art provides an outstanding example of enrichment of the arts through generous private support.

In the early 1960s, Owen and Leone Elliott of Cedar Rapids offered to the University their extensive collection of nineteenth- and twentieth-century paintings, prints, antique silver, and rare jade on the condition that a museum could be built to house it, along with the University's existing and future acquisitions of art.

In response to this challenge, more than 2,000 individuals and business firms contributed funds for the museum's construction cost. The museum opened in 1969 and quickly earned recognition as one of the nation's finest university museums. A gift from the late industrialist Roy Carver of Muscatine made possible the construction of a major addition opened in 1976.

Other important gifts include prints by Webster and Gloria Gelman of Iowa City, ceramics by Joan Mannheimer of Des Moines, and pre-Columbian artifacts by Eugene and Ina Schnell of Massachusetts.

University Theatres

University Theatres is the production unit of the Department of Theatre Arts, a pioneer in the study of all aspects of theatrical production. Emphasis is placed on the development and production of new and experimental works.

University Theatres welcomes all persons who want to participate in theatrical production. Information about the productions is available from the departmental office in the Theatre Building.

The Theatre Building is one of the finest educational theatre complexes in the country, housing three theatres and up-to-date facilities for classroom, laboratory, shop, and performance work. The E.C. Mabie Theatre, a continental-style, 477-seat proscenium playhouse, is one of the finest small theatres of its type in the United States. Theatre A is a "black box" production space with flexible seating units that accommodate from 140 to 225, permitting quick modification of space-audience relationships. The third theatre, seating 144, is an open-stage theatre dedicated primarily to the production of new and experimental works from the Playwrights Workshop.

All three theatres are equipped with state-of-the-art electronic lighting control and sound reproduction systems. Several shops for building, painting, maintaining, and storing scenery, costumes, and properties as well as the specialized classrooms for acting and design complete the Theatre Building facilities.

The Playwrights Workshop, ranked among the nation's most distinguished playwriting programs, is a unit of the Department of Theatre Arts. The department presents an annual festival of new scripts from the workshop, which also maintains close ties with the Iowa Writers' Workshop.

School of Music

Opened in 1971-72, the home of the School of Music is spacious and convenient. Its broad corridors lead from rehearsal rooms to two recital halls and to the stage of Hancher Auditorium.

In a given year, faculty artists and student ensembles present about 150 major concerts and nearly 200 vocal and instrumental recitals are presented by students.

Clapp Recital Hall, with its hand-crafted Cassavant tracker organ, seats 720 for public concerts. The 200-seat Harper Hall is both a classroom and the setting for many recitals. The school's largest ensembles (symphony orchestra, bands, Opera Theater, and choirs) perform regularly in Hancher Auditorium. The Opera Studio, opened in 1983, is the scene for smaller productions of the Opera Theater.

The school has produced opera since 1938. Like other major stage presentations, opera is interdepartmental in its opportunities for educational and performance experience, utilizing the talents and resources of other units of the Iowa Center for the Arts, particularly dance.

The School of Music is at the vanguard of innovation in the arts, creating and performing works in new forms. Its Center for New Music, originally funded by the Rockefeller Foundation, is a laboratory and extension of the composition area. Faculty and student members of the Center for New Music form a repertoire ensemble for the performance of both new compositions and masterworks of the twentieth century.

Two experimental music studios provide a wide range of technical capability for creative audio-musical forms, including computer-generated music. Works created in the studios are presented with other student compositions in an annual series of performances by the Composers Workshop, a program of the School of Music. Outstanding recording facilities link the various performance spaces of the School of Music/Hancher Auditorium complex with a central recording studio in the School of Music.

Hancher Auditorium

Hancher Auditorium is a regional cultural resource of the first magnitude. The 2,676-seat facility opened in 1972 and in its first 17 seasons has hosted audiences of more than 2.5 million people. The auditorium is fully accessible to the handicapped and provides wheelchair seating. Hancher also has installed a hearing augmentation system, which is available free of charge to patrons who are hearing impaired.

The diversity of Hancher's programming appeals to the broad range of tastes in the region and within the University community. In recent years, such world famous artists as Isaac Stern, Miles Davis, and Kathleen Battle have performed at Hancher, as have stars of the avant-garde, including Kronos Quartet, Laurie Anderson, and Philip Glass. National touring companies regularly present the Broadway hits; in 1989 eight performances of *Les Miserables* broke all Hancher box office records.

Hancher has highlighted international performers, including the electrifying Japanese drummers Kodo, the Dance Company of Senegal, and the South African play *You Strike the Woman, You Strike the Rock*. From jazz to chamber to symphonic music, from Shakespeare to *Nunsense* to the Peking Opera and the Peking Acrobats, Hancher presents the full range of the world's performing arts.

Hancher also has been an active catalyst for artistic creativity. In 1987, the auditorium co-produced The Joffrey Ballet's new production of *The Nutcracker*, which had its world premiere on the Hancher stage. The auditorium also has commissioned important new works for The David Parsons Dance Company, The Paul Dresher Ensemble, Kronos Quartet, and the Laura Dean Dancers. It has been the primary sponsor of the Iowa Dance Residencies Program, which has brought important dance companies for extended residencies including workshops, master classes, and performances in communities throughout the region.

The auditorium has become a Midwestern showplace. Handsome lobbies, a cafe and gift shop, excellent acoustics, and a surprising intimacy in its interior design make it one of the foremost concert halls in America. But it is much more than a showcase. It also is a splendid educational plant, designed as an extension of the classroom and laboratory facilities of all of the performing units of the Iowa Center for the Arts.

For students of the various theater arts, the auditorium has spacious scene construction and costume shops, nearly 50 sets of rigging for scenery changes, and a sophisticated lighting control and sound system. For music students, Hancher is an on-the-premises concert hall.

The stage itself is an excellent educational resource. Its proscenium is 70 feet wide. With its adjacent wings, the stage area is 175 feet long, 55 feet deep, and eight stories high. Mobile units of a concert shell can be installed quickly on stage for various concert requirements. University students are entitled to purchase tickets at reduced prices. Nonstudent patrons regularly attend auditorium events from a wide region in Iowa and western Illinois.

Arts Education/ Outreach Program

Cultural projects and programs that utilize the talents of faculty or student artists and other resources of the Iowa Center for the Arts are available to Iowa communities through the Arts Education/Outreach Program. Intended to share the University's cultural resources as widely as possible throughout the state, the program is designed to reach new audiences and to serve a variety of constituencies, including colleges, schools, arts councils, concert associations, museums, churches, centers for senior citizens and the handicapped, service organizations, and other special community organizations.

Consistent with the University's resources, the educational outreach projects are tailored to meet local needs and interests. In addition to programming throughout the state, the Arts Education/Outreach office schedules on-campus conferences, workshops, performances for young audiences, and other educational projects.

Dance Department

The dance department, housed in Halsey Hall, enjoys some of the finest facilities in the nation: seven studios, two classrooms, audio-video-computer rooms, a library, and a 250-seat theater in North Hall. Teaching

responsibilities are shared by seven full-time faculty and four to six teaching assistants. Ninety percent of the technique classes are accompanied by a staff of two full-time and four part-time accompanists, and a full-time technical director attends to all of the department's production needs.

Students in the department have many opportunities to perform during the year: the University of Iowa touring company Dancers To Go (in collaboration with the Arts Education/Outreach Program), the yearly Dance Gala held in Hancher Auditorium, faculty, student and thesis concerts in the Dance Department's Space/Place, theater, the School of Music spring opera, summer musical theater in conjunction with the Department of Theatre Arts, and community performances.

Teaching opportunities for graduate and undergraduate students can be found within the Arts Outreach Program, Young Dancers Program, Saturday Dance Forum, Saturday and Evening Class Program, and graduate teaching assistantships.

By scheduling nearly every nationally known company to perform in its theater, Hancher Auditorium is an invaluable resource for dance students, enabling them to see performances, observe rehearsals, and take master classes from touring companies.

For the past eleven years, the department has participated in the American College Dance Festival Association (ACDFA) festivals and hosted them in 1981 and 1986. The University of Iowa is the home of the U.S.-China Exchange Program, which brings Chinese dancers and master teachers to campus, and for three years has been host to the Seven States Choreographic Competition for emerging Midwest choreographers.

Broadcasting and Film

A division of the Department of Communication Studies, Broadcasting and Film fosters creative work in the video arts. Its faculty members often work with artists in other units of the Iowa Center for the Arts, and they enjoy a national audience. For example, a music video based on the School of Music production of Puccini's *Madame Butterfly* has been shown on the Bravo! cable television channel; other videos have been produced with jazz artists.

Writing Programs

A longtime program of special distinction in the Department of English, the Writers' Workshop provides opportunities for talented writers to work and learn with established poets and novelists.

The International Writing Program brings accomplished writers of many nationalities to the University for extended periods of new writing and translating their works into English and other languages.

These writing programs are renowned in many countries and have won widespread private support from foundations, business corporations, individuals, and the U.S. State Department.

Windhover Press

The skills of making books by hand—using handmade paper, handwrought illustrations, hand-set type, and hand-operated presses—may be learned in the workshop of the Windhover Press.

The Windhover Press is one of the nation's small company of distinguished hand presses. Its limited editions frequently are cited for their excellence by the American Institute of Graphic Arts, whose prestigious competitions involve all of the major publishers in the country.

MUSEUM OF NATURAL HISTORY

The museum, located in Macbride Hall, is an outgrowth of the Cabinet of Natural History, established in 1858 by an act of the Iowa General Assembly. It is the oldest university museum west of the Mississippi River.

To meet the needs of the general public and the various natural science departments of the University, the Museum of Natural History provides a repository and the proper care for objects and specimens that come to the University either by gift or through the efforts of its own collectors. These collections, with primary focus on Iowa and the Midwest region, are representative of the disciplines of biology, geology, and anthropology and are used for research and teaching by University faculty and students as well as for public exhibition and interpretation.

The Museum of Natural History, a department in the College of Liberal Arts, also supports a museum studies program that provides instruction in the history, philosophy, operations, and management of museums.

The museum's Iowa Hall gallery features 60 multisensory exhibits linked by space, theme, and time, illustrating Iowa's natural heritage—its geology, native culture, and ecology. Exhibit highlights of Iowa Hall include the Marquette-Joliet diorama, Devonian reef, Mesquakie Lodge, and a life-size reconstruction of an Ice Age giant ground sloth.

In Bird Hall, the Laysan Island cyclorama is a large and well-known bird habitat exhibit comprising a complete representation of a bird island of the Hawaiian group. Other habitat exhibits include the Bering Sea, Louisiana Swamp, fall migration, and cranes on the South Dakota prairie. The crane exhibit includes both the sandhill crane and the rare whooping crane as they appear on the prairie during migration. Mammal Hall habitat exhibits feature walrus, bison, antelope, mountain lion, moose, and giant panda. Also displayed is a complete 47-foot-long skeleton of the rare Atlantic right whale.

The major invertebrate phyla are represented in several exhibits and include familiar groups such as insects and crustaceans, snails and clams, sea stars, and corals.

Ethnological exhibits in the museum present artifacts from many parts of the world. Indian and Eskimo materials, including beadwork and carved ivory received in the late nineteenth century, are exhibited. The ancestry of humans through 12 million years of time is portrayed in a display featuring replicas of fossil remains from Africa, Asia, and Europe.

The Museum of Natural History also supports formal outreach programming to area schools and sponsors a weekend lecture and field trip series for the general public.

OLD CAPITOL

Iowa's Old Capitol, a National Historic Landmark, is central to the University campus. It was the capitol of the Territory of Iowa from 1842 until 1846 and the capitol of the state of Iowa from 1846 until 1857, when the government moved to Des Moines and gave Old Capitol to the University as its first permanent building.

Various University offices and departments have been located in Old Capitol through the years, and it housed the office of the University president continuously from 1860 to 1970, when the president's office was relocated in preparation for the restoration of Old Capitol as a historic site.

The restoration returned the structure to the three periods of its use: the territorial government period, the state government period, and the University's long use of the building, represented in rooms of 1920s decor. Old Capitol was reopened in 1976 as a "living museum." Guided tours and a slide presentation are offered daily without charge. Reservations are required for group tours.

OTHER SERVICES

Evaluation and Examination Service

The Evaluation and Examination Service administers placement and exemption tests designed to assist entering students in course selection. The Exam Service also provides registration information and administration of local and national test programs including the American College Testing Program (ACT), College Level Examination Program (CLEP), Medical College Admission Test (MCAT), Graduate Record Examination (GRE) Aptitude Test,

Graduate Management Admission Test (GMAT), Law School Admissions Test (LSAT), Test of English as a Foreign Language (TOEFL), and the National Teacher's Exam (NTE).

The Exam Service duplicates, scores, and analyzes classroom tests; assists in planning and processing course evaluations; conducts institutional research; prepares reports and technical bulletins pertaining to test development, grading, questionnaire design, and student profiles; and provides consultation on questionnaire development and use.

Printing Department

The Printing Department is the University's in-house printer, serving faculty, staff, and students. This full-production facility offers design, editorial, composition, typesetting, pasteup, platemaking, copying, duplicating, printing, and binding services. The department's ten copy centers, located throughout the campus, offer quick printing.

A variety of services are available to desktop publishers. For those who prefer conventional typesetting, state-of-the-art computers allow customers to telecommunicate material or submit floppy disks.

The Printing Department is responsible for University compliance with the printing regulations of Iowa, including provision for obtaining competitive bids on printing purchased outside the University.

The University of Iowa Alumni Association

Since its organization in 1867, The University of Iowa Alumni Association has worked to encourage graduates, former students, and friends to continue their involvement with the University. In addition to offering traditional programs such as class reunions and homecoming, the association provides alumni enrichment programs, sponsors a network of alumni clubs that take the University to alumni throughout the state and nation, recognizes distinguished alumni, and publishes a bimonthly magazine, the *Iowa Alumni Review*, to keep its forty thousand members up-to-date on University news and alumni achievements.

The Alumni Association also serves the University through its ASIST program, in which alumni help outstanding prospective students get acquainted with the University. It provides financial assistance to academically talented students through the Alumni Scholars Program and works to bring students, their parents, and UI faculty together through programs such as the annual fall parents weekend.

Outreach activities of the Alumni Association are supported primarily by membership dues.

University of Iowa Foundation

The University of Iowa Foundation was organized in 1956 to help the University obtain the greatest possible educational benefit from private giving. The foundation is the main channel for private gifts to The University of Iowa through annual giving programs, anniversary class gifts, planned gifts such as bequests and trusts, and capital and other special purpose campaigns.

The foundation is a private, nonprofit corporation empowered to solicit and receive gifts and bequests; to accept trusts subject to the conditions imposed on them; and to hold, administer, manage, use, or distribute gifts, bequests, and trusts—all for the benefit of The University of Iowa. The foundation is constantly at work to provide more funds for student financial aid, faculty support, research, library and equipment acquisitions, and other needs throughout the University.

The foundation currently is conducting a nationwide major gifts campaign, Iowa Endowment 2000: A Covenant with Quality, to raise $150 million by the year 2000 in support of human resources. Endowed faculty chairs, fellowships for graduate and professional students, scholarships, academic excellence funds for the University's colleges, and The University of Iowa Libraries all will benefit from the campaign.

University of Iowa Press

The University of Iowa Press was established to publish significant results of original scholarly research and outstanding creative work in the arts. The imprint is overseen by the University Editorial Advisory Board, composed of faculty members and students appointed by the vice president for educational development and research.

Office of University Relations

The Office of University Relations (OUR) works to promote understanding of, participation in, and support of the University's mission and activities, both within the University community and among the general public. It seeks to maintain an effective communication program including the use of internal and external media. It counsels the University administration on University relations matters and serves as a liaison to facilitate communication between the central administration and appropriate University, governmental, civic, and other groups.

University Relations programs are implemented through the coordinated efforts of the department's University News Service (UNS) and University Relations Publications. UNS includes staff who specialize in coverage of the performing arts, the health sciences, and women's intercollegiate athletics as well as general news, broadcast news, and photography units. These units supply news, photos, and information to print and electronic media; answer requests for information; serve news media in a variety of ways; and assist writers, photographers, and broadcasters who visit the campus.

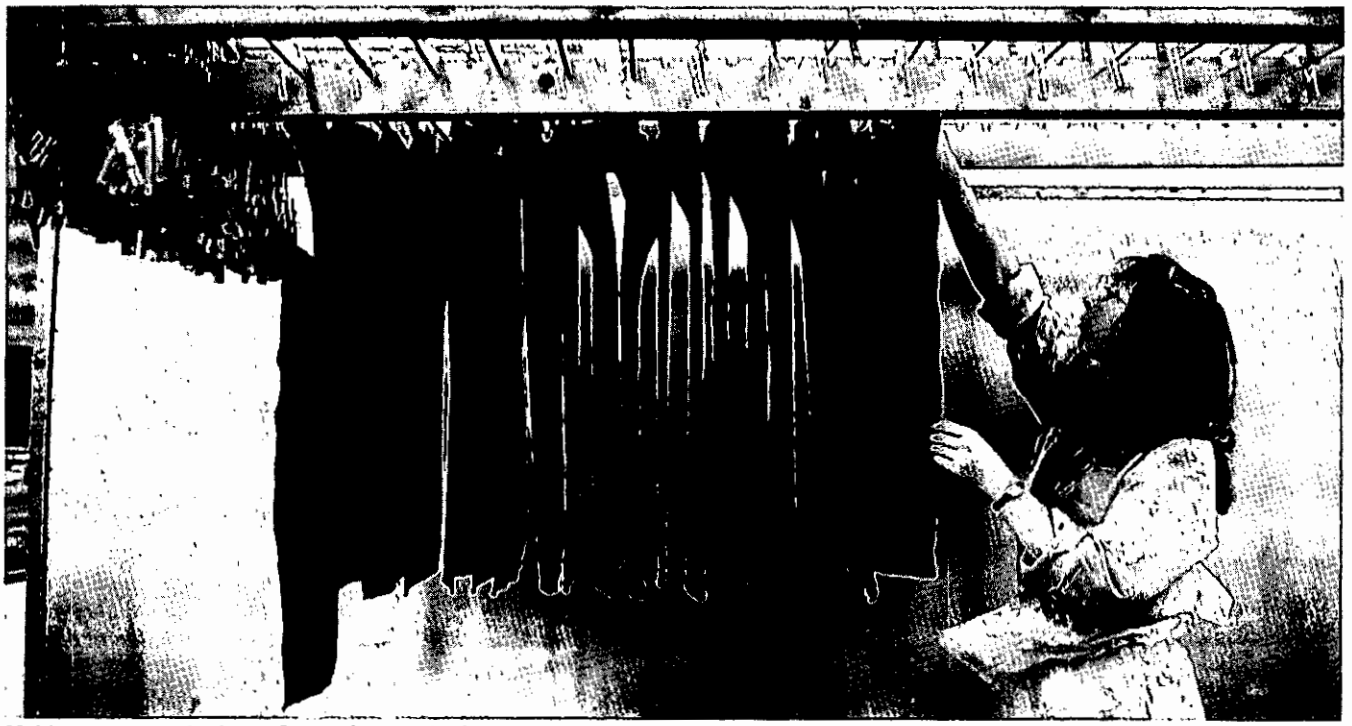
University Relations Publications publishes *SPECTATOR* for alumni and friends of the University; the general University *Calendar of Events; Parent Times* for students' parents; **fyi**, the University's newsletter for faculty and staff; *Artslowa*, featuring forthcoming arts activities; specialized materials for prospective students, in association with the Office of Admissions; and other special and general interest publications for external audiences.

OUR also serves as the executive office of the Parents Association.

University Ombudsperson

The Office of the University Ombudsperson responds to problems and disputes brought forward by all members of the University community—students, staff, and faculty—that appear unresolvable through existing channels. The ombudsperson investigates claims of unfair treatment or erroneous procedure and serves as a neutral and detached listener, information resource, adviser, intermediary, and mediator. See "University Ombudsperson" in the Student Life at Iowa section of the *Catalog*.

College of Liberal Arts



Making paper at the Iowa Center for the Book

Dean: Gerhard Loewenberg
Associate dean for academic programs: James B. Lindberg
Associate dean for development and research: Paul S. Muhly
Associate dean for faculty: Judith P. Aikin
Director of honors: Irwin P. Levin

The educational programs offered in the College of Liberal Arts provide the necessary foundation for the specialized education or training that many occupations and professions require. They form the basis for graduate work and provide prerequisites for professional study in dentistry, medicine, nursing, pharmacy, business, law, and education. They also provide a general education, which by itself prepares students for a broad range of occupations.

Liberal education is general in the breadth of intellectual development that it affords, but it is not superficial. The College of Liberal Arts offers 58 specific degree programs, each requiring extensive study in a particular academic discipline or set of related disciplines. The array of educational programs available in the college gives students a wide choice of major and minor fields of study.

Regardless of the major a student selects, the curriculum of the college exposes all students to work in mathematics, logic or quantitative reasoning, and a foreign language and requires a course in reading, speaking, and writing. Further, all students must become acquainted with the study of history, the natural sciences, the social sciences, and the humanities, as well as with civilizations and cultures remote in time or space.

These General Education Requirements are designed to enable students to understand the physical world in which they live, the social organizations in which they act, and the values of the civilizations they have inherited. The discoveries of scholars and the creative work of artists and writers in this century have greatly expanded our knowledge of natural and social phenomena and have heightened our aesthetic sensibilities. The complexity of the modern world is matched by our increased ability to understand it. That understanding, however, depends more than ever on acquiring a general education.

It is the mission of the College of Liberal Arts to make that general education available and to guide students through the many options they have in obtaining it. A liberal education compensates for the narrowness that is the price of specialization. It develops the capacity to raise significant questions, to find answers, to reject dogma, to be free of superstition, and to adapt to change.

College Organization

The internal organization of the College of Liberal Arts reflects its multifaceted character. The college is composed of units of various ranks: divisions, schools, departments, programs, and nondepartmental units. There are three divisions in the college. The Division of Fine Arts embraces the School of Art and Art History, the School of Music, and the Departments of Communication Studies, Dance, and Theatre Arts. The Departments of Computer Science, Mathematics, and Statistics and Actuarial Science compose the Division of Mathematical Sciences. The Division of Physical Education includes the Departments of Exercise Science, Leisure Studies, and Physical Education and Sports Studies. Within the college there are six schools. In addition to the Schools of Art and Art History and Music, there are Schools of Journalism and Mass Communication, Library and Information Science, Religion, and Social Work. More than forty formally organized departments and programs provide instruction in the college and offer majors leading to one or more degrees, minors, or certification in a particular field.

The College of Liberal Arts is closely linked with the University's professional colleges. Some departments in other colleges offer degrees and minors in liberal arts; similarly, other colleges may award minors for work done in liberal arts. For example, students admitted to the teacher education program of the College of Education are degree candidates in the College of Liberal Arts. The College of Liberal Arts also provides instruction for undergraduates enrolled in the Colleges of Business Administration, Engineering, Medicine, Nursing, and Pharmacy.

Degrees, minors, certificates, and programs of the College of Liberal Arts are described in full under separate entries in the *Catalog*.

Liberal Arts Office of Academic Programs

The Liberal Arts Office of Academic Programs is an integral part of the Office of the Dean. Located in 116 Schaeffer Hall, it serves students who wish to declare or change majors, file the second-grade-only option, or request special permission for a dean's signature for administrative actions such as late registration, late adding or dropping of courses, and late withdrawal of registration.

Staff members answer questions about the General Education Requirements, graduation requirements, and collegiate policies affecting students; coordinate the advising of candidates for the B.A. in interdepartmental studies and the Bachelor of General Studies (B.G.S.); conduct interviews with students on academic probation; conduct reviews of students on academic probation and take dismissal actions; and respond to requests for reinstatement after dismissal.

The Office of Academic Programs also considers evidence and recommends appropriate disciplinary action for student plagiarism, cheating, forgery, and other academic misconduct. Students requesting exceptions to the rules and requirements of the college petition the Student Appeals Committee through the Office of Academic Programs.

Honors Program

The College of Liberal Arts Honors Program offers special academic and extracurricular opportunities to outstanding students. Freshmen and sophomores may take advantage of special honors sections that are offered in some general education courses. At the junior and senior level, most departments offer honors seminars, independent research, and the opportunity to pursue a senior project under the guidance of a faculty member. Successful completion of a senior honors project leads to a baccalaureate degree "with honors" in the major (see "Graduation with Honors" in this section of the *Catalog*).

The Shambaugh House Honors Center is a meeting place and study center for students in the honors program. It houses a reference library, study lounges, and computer terminals. Each year the Associated Iowa Honors Students plans a variety of activities—recreational, social, cultural, and academic. Entering students with strong academic records are invited to join the honors program, but any student whose grade-point average meets the required minimum (3.20) may join at any time. For further information, contact the College of Liberal Arts Honors Program, Shambaugh House Honors Center.

Degrees Offered

Students graduating from the College of Liberal Arts may earn Bachelor of Arts (B.A.), Bachelor of Science (B.S.), Bachelor of Fine Arts (B.F.A.), Bachelor of General Studies (B.G.S.), Bachelor of Liberal Studies (B.L.S.), and Bachelor of Music (B.M.) degrees.

Major Fields

The college confers degrees as indicated in the following major fields. The B.G.S. and B.L.S. degrees are awarded with no major designations.

Actuarial science—B.S.*

African-American world studies—B.A.

American studies—B.A.

Ancient civilization—B.A.

Anthropology—B.A.

Art—B.A., B.F.A.

Asian languages and literature—B.A.

Asian studies—B.A.

Astronomy—B.A., B.S.

Biochemistry—B.A., B.S.

Biology—B.A., B.S.

Botany—B.A., B.S.

Chemistry—B.A., B.S.

Classics—B.A.

Communication studies—B.A.*

Comparative literature—B.A.

Computer science—B.A., B.S.*

Dance—B.A., B.F.A.

Dental hygiene—B.S.

Economics—B.A., B.S.

Elementary education—B.A., B.S.*

English—B.A.

Exercise science—B.S.*

French—B.A.

Geography—B.A., B.S.

Geology—B.A., B.S.

German—B.A.

Greek—B.A.

Health occupations education—B.A., B.S.

History—B.A.

Interdepartmental studies—B.A.

Italian—B.A.

Journalism and mass communication—B.A., B.S.*

Latin—B.A.

Leisure studies—B.S.*

Linguistics—B.A.

Literature, science, and the arts—B.A.

Mathematics—B.A., B.S.

Microbiology—B.S.

Music—B.A., B.M.

Philosophy—B.A.

Physical education—B.A., B.S.

Physics—B.A., B.S.

Political science—B.A., B.S.

Portuguese—B.A.

Psychology—B.A., B.S.

Religion—B.A.

Russian—B.A.

Science education—B.S.

Social studies—B.A.

Social work—B.A.*

Sociology—B.A., B.S.

Soviet and East European studies—B.A.

Spanish—B.A.

Speech and hearing science—B.A., B.S.

Statistics—B.S.

Theatre arts—B.A.

*Students who wish to major in actuarial science, athletic training (an option within the B.S. in physical education), communication studies, computer science, elementary education, exercise science, journalism and mass communication, leisure studies, or social work must complete an application procedure before they are admitted to the major. Admission to these programs is based on grades in specified prerequisite courses, the cumulative grade-point average, and other criteria.

Majors in Education and Secondary Certification

Students may indicate a major in one of the fields of education or an interest in secondary education at the time of admission, or they may change their majors to one of these fields at any time after enrolling. In order to be allowed to enroll in the courses for an education major or certification, the student must be admitted to the teacher education program (TEP).

To be admitted to the TEP, a student must have attained sophomore standing (30 semester hours) and must have earned a total cumulative grade-point average of at least 2.50. Transfer students who meet these standards may apply to the TEP upon admission to the University. In order to remain in the TEP, a student must maintain a 2.50 total cumulative grade-point average and a 2.50 grade-point average at The University of Iowa.

Application forms for admission to the TEP are available from the Office of Student Services in the College of Education. For more information, see the College of Education section of the *Catalog*.

Double Majors

A student may meet the major requirements in more than one department, and if the departments award the same degree, the student may earn a single bachelor's degree with two or more majors (e.g., a B.A. in history and English or a B.S. in psychology and sociology). For more information, see "Double Majors" under "Requirements for the Major" in this section of the *Catalog*.

Specializations within Degree Programs

Many degree-granting units in the college offer internal specializations. Some of these are formal options within degree programs. For example, broadcasting and film is offered in the Department of Communication Studies, and urban and regional planning is offered in the Department of Geography. Specializations in Chinese, Hindi, Japanese, or Sanskrit are available to students seeking a B.A. in Asian languages and literature. The School of Art and Art History and the School of Music have many different tracks leading to bachelor's degrees: studio emphasis, art history emphasis, and art education; performance, composition/theory, music history, jazz studies, music education, and music therapy. These are only a few examples of the many options within degree programs.

Other specializations can be developed with combinations of courses taken from several areas—for example, a specialization in public relations and advertising, with courses taken in the Department of Communication Studies and the School of Journalism and Mass Communication; photography and graphic design specializations, with courses taken in the School of Art and Art History and the School of Journalism and Mass Communication; or a specialization in management, with courses taken in various social sciences departments.

For more information on specializations within and between programs, see the program descriptions in the *Catalog* and advisers in the appropriate departments.

Certificates

The College of Liberal Arts offers certificates in five interdisciplinary programs: African studies, aging studies, global studies, Latin American studies, and philosophies and ethics of politics, law, and economics. A sixth certificate program, international business, is administered jointly by the College of Business Administration and the College of Liberal Arts.

Certificates require from 18 to 27 semester hours of prescribed course work. Specific requirements are listed in the departmental sections of the *Catalog*.

Minors

Students may earn minors in more than 50 programs in the College of Liberal Arts or in other colleges of the University. Most minors require a minimum of 15 semester hours of course work. The general requirements for minors are described below, under "Minors." Specific requirements are listed in the departmental sections of the *Catalog*.

Interdisciplinary Programs

A number of interdisciplinary programs in the College of Liberal Arts offer majors, minors, or certificates. These programs include African studies (certificate); African-American world studies (B.A. or minor); aging studies (minor or certificate); American studies (B.A. or minor); ancient civilization (B.A. or minor); comparative literature (B.A. or minor); global studies (minor, certificate, or honors interdisciplinary major); interdepartmental studies (B.A.); international business (certificate); Latin American studies (minor or certificate); literature, science, and the arts (B.A.); philosophies and ethics of politics, law, and economics (certificate); science education (B.S.); Soviet and East European studies (B.A.); and women's studies (minor).

Specific requirements for these interdisciplinary degree programs, minors,

and certificates are described in the departmental sections of the *Catalog*.

Honors Interdisciplinary Major

Honors students may pursue an individually planned major in an area of study that draws on courses from two or more departments, as approved by the honors advisers from the departments concerned and the director of the College of Liberal Arts Honors Program. The major consists of 36 semester hours of credit, including 6 semester hours of departmental honors registration and completion of an honors project. It leads to the degree "with interdisciplinary honors."

Students must submit a plan of study for approval during their junior year. Examples of interdisciplinary programs developed by honors students are environmental studies; European studies; international development studies; literature, history, and philosophy; and methodological social sciences.

Baccalaureate with Early Admission to Medicine or Dentistry

Students who are working toward a baccalaureate degree from the College of Liberal Arts may accept early admission to The University of Iowa College of Medicine or College of Dentistry or to any accredited medical or dental school in the United States that offers advanced degrees.

To be eligible for a baccalaureate degree from the College of Liberal Arts after early admission to the Colleges of Medicine or Dentistry, students must meet certain requirements. Before enrolling in the medical or dental colleges, students must have:

- Satisfied the General Education Requirements;
- Completed the requirements for a major;
- Earned at least 94 semester hours as undergraduates; and
- Satisfied the residence requirement of the College of Liberal Arts.

Students who have successfully completed the first year of medical or dental school are permitted up to 30 semester hours of ungraded elective credit toward a baccalaureate degree from the College of Liberal Arts.

Students who plan to accept early admission to the Colleges of Medicine or Dentistry and who wish to receive a baccalaureate degree from the College of Liberal Arts must request a graduation analysis from the Office of the Registrar before their final semester in the College of Liberal Arts.

Combined Degree Program: Engineering and Liberal Arts

Students may earn two University of Iowa baccalaureate degrees in a combined program in the Colleges of Engineering and Liberal Arts. Successful candidates are awarded a B.S.E. (Bachelor of Science in Engineering) by the College of Engineering and a B.A. (Bachelor of Arts), B.S. (Bachelor of Science), B.F.A. (Bachelor of Fine Arts), or B.M. (Bachelor of Music) by the College of Liberal Arts.

Students in this combined program usually are able to meet the baccalaureate degree requirements of both colleges in about five academic years. The exact length of time necessary to complete the program is determined by the major areas of study selected in each college. Students who enter the combined degree program are assigned two faculty advisers, one in their major department in the College of Engineering and the other in their major department in the College of Liberal Arts.

To enter the combined degree program, students must be eligible for admission to the College of Engineering. Interested students should schedule an appointment with the assistant to the dean of the College of Engineering. Students must be approved for candidacy in the combined degree program by the College of Engineering and must be admitted to both the College of Engineering and the College of Liberal Arts.

Students who enter the program are required to complete the General Education Requirements and the requirements for the major in the College of Liberal Arts.

It is crucial that students enroll in the proper mathematics and engineering courses early in their course of study to expedite the completion of their program. The specific engineering courses taken by students vary according to the engineering major selected. Since courses in natural sciences, mathematics, humanities, and social sciences are accepted regularly for credit by both colleges, students may be able to satisfy the requirements of both colleges by taking a particular course.

To qualify for both degrees in the combined degree program, candidates must complete an overall total of 158 semester hours of credit, including at least 30 semester hours of courses offered by the College of Engineering and at least 30 semester hours of courses offered by the College of Liberal Arts.

Combined Degree Program: Medicine and Liberal Arts

Students may earn two University of Iowa baccalaureate degrees in a combined curriculum program in the Colleges of Medicine and Liberal Arts. Although students begin their academic program in the College of Liberal Arts, they must be eligible for admission to College of Medicine baccalaureate programs in medical technology, nuclear medicine technology, or physician assistant.

Students who select this program must meet the baccalaureate degree requirements specified by both colleges, and usually do so in about five academic years. The exact length of time necessary to complete the program is determined by the major areas of study selected in each college. Students who enter the combined degree program are assigned two faculty advisers, one in the major department of the College of Medicine and the other in the major department of the College of Liberal Arts.

Candidates must satisfy all requirements for both degrees and complete an overall total of 154 semester hours of credit, including at least 30 semester hours of courses offered by the College of Medicine and at least 30 semester hours of courses offered by the College of Liberal Arts.

Students interested in the combined degree program should see the director of the baccalaureate program of their choice in the College of Medicine.

Two Bachelor's Degrees

Students who wish to earn two different bachelor's degrees at the same time in the College of Liberal Arts must complete 30 semester hours beyond the 124 required for a single degree, for a total of 154 semester hours, besides satisfying the requirements for both degrees. The B.G.S. and B.L.S. may not be awarded simultaneously with another degree.

Students who already have been awarded a bachelor's degree from the College of Liberal Arts and are not enrolled in a graduate or professional program may earn an additional, different bachelor's degree. These students must be readmitted to the college and must complete at least 30 additional consecutive hours of study in residence in the college beyond the first degree.

Students may not earn a second B.A. if they already have a B.A. from the College of Liberal Arts, nor may they earn a second B.S. if they already have a B.S. from the college. Instead, these students should consider completing a second major (see "Returning for a Second Major," below).

Holders of B.A. or B.S. degrees in liberal arts disciplines are considered to have satisfied all the General Education Requirements except foreign language. Holders of other degrees must satisfy the General Education Requirements.

Students with bachelor's degrees from other colleges or universities may earn a bachelor's degree from the College of Liberal Arts by meeting the requirements described above.

Requirements for Graduation (B.A., B.S., B.F.A., B.G.S., B.L.S., and B.M. Degrees)

Total Hours Earned

Students who enter as beginning freshmen must earn a minimum of 124 semester hours of credit. The number required of a transfer student is indicated on the student's admission graduation progress report.

Satisfactory Grade-Point Average

The general requirements for graduation are based on the quality as well as the quantity of work completed.

Candidates for the B.A., B.S., B.F.A., and B.M. degrees satisfy the qualitative requirements for graduation by earning a minimum grade-point average of C (2.00) in all college work attempted, all work undertaken at The University of Iowa, and all work attempted in the major field, including 2.00 in all University of Iowa major work.

Candidates for the B.G.S. or B.A. in interdepartmental studies satisfy the qualitative requirements for graduation by earning a grade-point average of at least 2.00 in all college work attempted, all work undertaken at The University of Iowa, and all advanced courses attempted.

Candidates for the B.L.S. degree must earn a grade-point average of at least 2.00 in all course work applied toward the degree, all course work completed after admission to the program, and all upper-level course work.

Residence

Students must satisfy the College of Liberal Arts residence requirement. This may be met by earning the final 30 consecutive semester hours in residence, or 45 of the final 60 semester hours in residence, or an overall total of 90 semester hours in residence.

Nonresident instruction includes course work at other colleges and universities, course work done while the student is enrolled in other undergraduate colleges of The University of Iowa, and all work by correspondence, including University of Iowa Guided Correspondence Study courses.

B.L.S. students are not subject to the residence requirement but must earn at least 30 semester hours of credit at The University of Iowa after they are admitted to the program.

Students in the combined degree program in the Colleges of Engineering and Liberal Arts must complete at least 30 semester hours of courses offered by the College of Engineering and at least 30 semester hours of courses offered by the College of Liberal Arts.

Students in the combined degree program in the Colleges of Medicine and Liberal Arts must complete at least 30 semester hours of courses offered by the College of Medicine and at least 30 semester hours of courses offered by the College of Liberal Arts.

General Education Requirements

Students must complete the following General Education Requirements for the B.A., B.S., B.F.A., B.G.S., B.L.S., and B.M. degrees. Unified Program students follow a prescribed course of study that fulfills most General Education requirements. See "Unified Program," below.

Rhetoric: one or two courses (4-8 s.h.);

Mathematics: for students who first enrolled at the University before fall 1990; see "Mathematics," below;

Physical education: four courses (4 s.h.); B.L.S. students are exempt from this requirement;

Foreign language: fourth-semester level of college language or fourth-year level of high school language (0-18 s.h.);

Foreign civilization and culture: one approved course (3-4 s.h.);

Historical perspectives: two approved courses (6 s.h.);

Humanities: 8G:1 The Interpretation of Literature and two approved courses (9 s.h.);

Natural sciences: two approved courses, one of which must have a laboratory component (7 s.h.);

Quantitative or formal reasoning: one approved course (3-4 s.h.);

Social sciences: two approved courses (6 s.h.).

The Unified Program

The Unified Program (UP) is a four-semester series of integrated general education courses for a small group of students who choose the program when they are freshmen. UP satisfies all of the College of Liberal Arts General Education Requirements except the foreign language and physical education requirements, and each UP course is interchangeable with an equivalent approved course. All students in UP take the same courses in a given semester. Students may leave the program at any time and satisfy the General Education Requirements in other ways, but only freshmen may enter UP. See "Unified Program" in this section of the *Catalog*.

Rhetoric

All students must register for their assigned rhetoric course at their first or second registration, as required, and continue to enroll in rhetoric courses until the requirement is completed. Students are not permitted to drop rhetoric courses.

All transfer students, regardless of the number of hours they transfer, must satisfy the rhetoric requirement.

The rhetoric requirement may be completed in one of the following ways:

By passing 10:1 and 10:2 Rhetoric (8 s.h.);

By passing 10:3 Rhetoric (4 s.h.);

By passing the speech test and 10:4 Rhetoric (3 s.h.);

By passing the essay test and 10:6 Principles of Speech Communication (3 s.h.); or

By passing both the speech and essay tests.

Proficiency Examinations

Placement and exemption tests are given during the first week of classes for students registered in rhetoric courses. Exemption from part or all of the requirement may be awarded on the basis of these tests. Academic credit is not given. For further information, see "Rhetoric" in the current *Schedule of Courses*.

Students with Documented Learning Disabilities

Students who have undergone formal assessment by the Office of Services for Persons with Disabilities and who are found to be learning disabled in rhetoric may request reasonable accommodations in order to complete the rhetoric requirement satisfactorily. Such accommodations must be arranged by the Office of Services for Persons with Disabilities and approved by the Department of Rhetoric.

Mathematics

Students who enrolled at The University of Iowa for the first time before August 1990 also must satisfy a mathematics requirement. The requirement may be met by two years of high school algebra and one year of high school geometry, by satisfactory tests scores, or by courses taken at The University of Iowa or another institution. Complete information is available in the Office of Academic Programs, 116 Schaeffer Hall.

Physical Education

The physical education requirement may be satisfied in one of the following ways:

By completing four 1-semester-hour courses in physical education skills (10:41 or 10:42), for a total of 4 semester hours; or

By completing 10:45 (2 s.h.) and two 1-semester-hour courses in physical

education skills, for a total of 4 semester hours.

Students also may earn exemption from part or all of the requirement by passing tests in specific physical education skills (see below).

Only courses 10:41, 10:42, and 10:45 may be used to satisfy the requirement. Each course is graded satisfactory/fail. 10:41 and 10:42 are skills courses, and sections under these numbers have activity or sports titles and levels of proficiency. 10:41 designates courses that meet for the first half of the semester or for the eight-week summer session; 10:42 designates those that meet for the second half of the semester. 10:45 Fitness and Wellness for Life (2 s.h.), a lecture-discussion course, meets for the entire semester. Students who take 10:45 must satisfy the remainder of the requirement by taking two 1-semester-hour skills courses or exemption tests.

If a student repeats the same skills course or takes a more elementary one, the Office of the Registrar assesses a penalty for either duplication or regression. In removing incompletes or using the second-grade-only option, students must complete or retake the same activity or sport at the same level.

Exemption Tests

Students may be awarded exemption from part or all of the physical education requirement for successful completion of comprehensive tests in specific physical education activities or sports. Each test has both written and performance components. Successful completion of a proficiency test results in exemption from 1 semester hour of the physical education requirement. Academic credit is not awarded, only exemption. For more information, see "Physical Education Skills" in the current *Schedule of Courses*.

Transfer Students

Transfer students may satisfy the physical education requirement in one of the following ways:

By transferring 4 semester hours of college physical education course work (skills, sports, and activities);

By achieving junior standing (60 s.h.) before admission to The University of Iowa; or

By earning enough credit in physical education at Iowa to make a total of 4 semester hours combined with physical education credit transferred from other colleges.

Older Students

Students who have passed their twenty-third birthday before their first enrollment at the University or will pass their twenty-eighth birthday before the day of their graduation are excused from the physical education requirement.

Veterans

Veterans may be exempted from this requirement by presenting to the Office of the Registrar official evidence of having completed a basic training program in a branch of the armed forces.

B.L.S. Students

Candidates for the B.L.S. degree are exempt from the physical education requirement.

Foreign Language

The foreign language requirement may be satisfied by high school courses, college courses, combinations of high school and college courses, or satisfactory performance on a proficiency examination.

All degree candidates who enter the University in fall semester 1990 and after must satisfy the foreign language requirement in one of the following ways:

By completing the fourth-year level of a foreign language in high school;

By completing the fourth-semester level of college language at The University of Iowa, at another college or university, or during study abroad;

By completing sequential years of one language in high school followed by sequential semesters of the same language in college; one year of high school study in a foreign language is considered the equivalent of one semester of college work; students must successfully complete the fourth-semester level of college language to satisfy the requirement; or

By passing an achievement test measuring proficiency equivalent to that usually attained after four semesters of college study.

B.S., B.F.A., B.G.S., and B.M. candidates who entered the University before fall semester 1990 and who will graduate by August 1994 may satisfy either the fourth-semester requirement described above or a second-semester requirement; complete information is available in the Office of Academic Programs, 116 Schaeffer Hall.

B.L.S. candidates who enrolled at The University of Iowa for the first time before fall semester 1990 and who will graduate by August 1997 are exempt from the foreign language requirement.

Foreign Language Placement

Entering freshmen are required to take a University of Iowa foreign language language in high school are exempt from this requirement unless they wish to participate in the Foreign Language Incentive Program (see below).

Results from the placement test are used to determine the level at which students begin their language study at The University of Iowa. In determining placement, academic advisers also may consider number of years studied in high school, grades earned, experience abroad or with native speakers, and length of time elapsed since the language was last studied, if such consideration would result in a higher placement.

Effective Fall Semester 1991

Entering students who place at the second-semester level or higher may continue study in that language for full credit or begin study of a different language for full credit.

Those who place below the second-semester level are required to complete the first semester of language study for a letter grade but without credit toward graduation.

Effective Fall Semester 1993

Entering students who place at the third-semester level or higher may continue study in that language for full credit or begin study of a different language for full credit.

Those who place below the third-semester level are required to complete the first year of language study for a letter grade but without credit toward graduation.

Foreign Language Incentive Program

Entering students who place into a fourth-semester language course and complete the course with a grade of B- or higher receive credit for the prerequisite third-semester course. Those who place into a fifth-semester or higher level course and complete it with a grade of B- or higher receive credit for the two prerequisite third- and fourth-semester courses. The credit is ungraded but counts toward the hours required for graduation. Incentive credit is not granted for college courses for which transfer credit has been received.

Students must file for incentive credit when they register or during the first three weeks of the semester in which they are taking the course, in the Office of Academic Programs, 116 Schaeffer Hall. Students who take the course during the summer must file within the first one and one-half weeks of the summer session. Incentive credit is considered credit by examination.

Proficiency Examinations in Foreign Languages Offered at Iowa

Students proficient in a language for which they have received no formal instruction may validate their proficiency by examination. Students proficient in French, German, or Spanish should take one of the placement examinations regularly administered to entering freshmen during the summer orientation programs and each semester just before the opening of classes. Proficiency examinations in other languages may be arranged by contacting the appropriate department. Academic credit is not awarded for successful completion of these examinations.

Satisfactory test results on Advanced Placement Program examinations in French, Latin, or Spanish satisfy the foreign language requirement. In many cases, academic credit is awarded. Complete

information is available from the Evaluation and Examination Service or the Office of Academic Programs.

Proficiency Evaluations in Foreign Languages Not Offered at Iowa

Students who are proficient in a foreign language not regularly offered at The University of Iowa may apply to the Office of Academic Programs for assessment. In some cases, arrangements can be made for an on-campus proficiency evaluation. Evaluations are available for only a limited number of foreign languages, however. Academic credit is not awarded for successful completion of these evaluations.

Students proficient in a language for which testing is not available must complete the requirement by another approved method.

Students with Documented Learning Disabilities

Students who have undergone formal assessment by the Office of Services for Persons with Disabilities and are found to have a language learning disability may substitute other approved courses to satisfy the foreign language requirement. Such substitutions must be approved in the Office of Academic Programs, 116 Schaeffer Hall.

Foreign Students and the Foreign Language Requirement

Foreign students who hold nonimmigrant student visas may use English to satisfy the foreign language requirement if they have completed secondary school in a language other than English and if they meet the college's English proficiency requirement. The English proficiency requirement may be satisfied in any one of the following ways: (a) a score of 600 or above on the Test of English as a Foreign Language (TOEFL); (b) successful completion of required English courses as determined by an evaluation conducted by the linguistics department; or (c) validation of English proficiency by the coordinator of English as a Second Language.

Foreign students who completed secondary school (grades 9-12 or 10-12) in English may not use English to meet the foreign language requirement. These students must satisfy the foreign language requirement by another approved method, perhaps by using their native language.

Sequences of Courses That Satisfy the Foreign Language Requirement

Chinese: 39:1-2-9 or 39:8-9

Dutch: 13D:11-12 and 13D:21-22

French: 9:1-2 or 9:100 followed by 9:11-12, or 9:105 and 9:12, or 9:105 and 9:26, or 9:105-106

German: 13:11-12 or 13:13 or 13:14 followed by 13:21-22 or 13:25; or 13:26-27

Greek: 14:1-2 and 14:11-12

Hindi: 39:31-32-33-34

Italian: 18:1-2 and 18:11-12
or 18:103 and 18:11-12

Japanese: 39J:1-2-9 or 39J:8-9

Latin: 20:1-2 and 20:16-17
or 20:15-16-17
or 20:117 and 20:16-17

Portuguese: 38:1-2 and 38:11-12
or 38:100 and 38:11-12

Russian: 41:1-2-3-4

Sanskrit: 39:21-22-23-24

Spanish: 35:1-2 or 35:8-9 or 35:1-9 or 35:8-2 or 35:3 followed by 35:11-12 or 35:13

Foreign Civilization and Culture

Students must complete at least 3 semester hours from the courses listed below. Some courses used to satisfy this requirement also may be approved to satisfy, in part, the historical perspectives, humanities, or social sciences requirement.

1H:5 Western Art and Culture Before 1400 3 s.h.
1H:6 Western Art and Culture After 1400 3 s.h.
1H:13 Islamic Art and Civilization 3 s.h.
1H:16 Introduction to Asian Art 3 s.h.
8G:14 Literatures of the African Peoples 3 s.h.
9:142 French and Francophone Literature and Culture 3 s.h.
9:147 French Cinema and Culture 3 s.h.
13:17 German Heroic and Erotic Literature of the Middle Ages 3 s.h.
13:101 Introduction to Modern German Literature I 3 s.h.
13:102 Introduction to Modern German Literature II 3 s.h.
13:105 German Cultural History 3 s.h.
13:115 Contemporary German Civilization 3 s.h.
13:118 The Third Reich and Literature 3 s.h.
14:13 The Classical Views 3 s.h.
16:1 Western Civilization to 1792 3 s.h.
16:2 Western Civilization Since 1792 3 s.h.
16:5 Civilizations of Asia 3 s.h.
16:6 Civilizations of Asia 3 s.h.
16E:106 Survey of Ancient Near East and Greece 3 s.h.
16E:107 The Hellenistic World and Rome 3 s.h.
16E:110 Medieval Civilization 3 s.h.
16:111 Colonial Latin America 3 s.h.
16:112 Introduction to Modern Latin America 3 s.h.
16:113 The Mexican Revolution 3 s.h.
16E:113 Economic and Social History of Medieval Europe 3 s.h.
16E:117 History of the Medieval Church 3 s.h.
16E:121 The Italian Renaissance: Cultural Transmission of Learning, Law, and Art 1250-1550 3 s.h.
16E:122 European Religious Reformations, 1250-1550 3 s.h.
16E:125 Society and Gender in Europe 1200-1789 3 s.h.
16E:134 Nineteenth-Century Europe 3 s.h.
16E:145 French Revolution and Napoleon 3 s.h.
16E:146 France from 1815 to the Present 3 s.h.
16E:148 Society and Gender in Europe 1750-1950 3 s.h.
16E:155 Germany 1786-1914: Nationhood, Society, and Culture 3 s.h.
16E:156 Germany Since 1914: Weimar, Hitler, and After 3 s.h.
16E:174 Medieval Russia 3 s.h.
16E:175 Muscovite Russia: 1280-1598 3 s.h.
16E:176 Imperial Russia: 1598-1801 3 s.h.
16E:177 Imperial Russia: 1801-1917 3 s.h.
16E:178 Soviet Union 1917-1953 3 s.h.
16E:179 Soviet Union 1953-Present 3 s.h.
16:193 History of Ancient and Traditional India 3 s.h.
16:194 Imperialism and Modern India 3 s.h.
16:195 Traditional China 3 s.h.
16:196 Modern China: 1800 to the Present 3 s.h.
16:197 Premodern Japan 3 s.h.
16:198 Modern Japan 3 s.h.
19:157 Third World Development Support 3 s.h.
25:103 World Music I 3 s.h.
30:141 Introduction to Soviet Government and Politics 3 s.h.
30:142 Government and Politics of the Soviet Union and Eastern Europe 3 s.h.
30:143 Government and Politics of the Far East 3 s.h.
30:144 Latin American Government 3 s.h.
30:145 Major States of Latin America 3 s.h.
30:146 African Development 3 s.h.
30:148 The Politics of Southern Africa 3 s.h.
32:4 Living Religions of the East 3 s.h.
32:169 Religion in India 3 s.h.
32:176 Chinese Religions 3 s.h.
32:182 Religion in Japan 3 s.h.
35:20 Contemporary Latin American Narrative 3 s.h.
36B:147 French Cinema and Culture 3 s.h.
36B:148 National Cinema 3 s.h.
38:20 Contemporary Brazilian Narrative 3 s.h.
39:16 Introduction to Asian Art 3 s.h.
39:18 Asian Humanities: India 3 s.h.
39:19 Asian Humanities: China 3 s.h.
39:20 Asian Humanities: Japan 3 s.h.
39:55 Civilizations of Asia 3 s.h.
39:56 Civilizations of Asia 3 s.h.
39:64 Living Religions of the East 3 s.h.
39:129 Ethnology of Southeast Asia 3 s.h.
39:133 History of Ancient and Traditional India 3 s.h.
39:134 Imperialism and Modern India 3 s.h.
39:153 Traditional China 3 s.h.
39:154 Modern China: 1800 to the Present 3 s.h.
39:161 Chinese Religions 3 s.h.
39:167 Religion in India 3 s.h.
39:178 Government and Politics of the Far East 3 s.h.
39J:125 Japanese Society 3 s.h.
39J:153 Premodern Japan 3 s.h.
39J:154 Modern Japan 3 s.h.
39J:161 Religion in Japan 3 s.h.

41:185 Russian Culture 3 s.h.
41:191 Russian Civilization 3 s.h.
41S:100 Introduction to the Soviet Union 3 s.h.
44:157 Third World Development Support 3 s.h.
44:161 African Development 3 s.h.
113:116 Ethnology of Mesoamerica 3 s.h.
113:118 Social Anthropology of the Caribbean 3 s.h.
113:125 Japanese Society 3 s.h.
113:127 Ethnology of Oceania 3 s.h.
113:129 Ethnology of Southeast Asia 3 s.h.
113:131 Latin American Economy and Society 3 s.h.
129:8 Literatures of the African Peoples 3 s.h.
129:115 Social Anthropology of the Caribbean 3 s.h.
131:181 Society and Gender in Europe 1200-1789 3 s.h.
131:182 Society and Gender in Europe 1750-1950 3 s.h.
141:14 Literatures of the African Peoples 3 s.h.
141:146 African Development 3 s.h.
141:148 The Politics of Southern Africa 3.s.h.

Historical Perspectives

Students must complete at least 6 semester hours from the courses listed below.

1H:5 Western Art and Culture Before 1400 3 s.h.
1H:6 Western Art and Culture After 1400 3 s.h.
1H:13 Islamic Art and Civilization 3 s.h.
1H:16 Introduction to Asian Art 3 s.h.
16:1 Western Civilization to 1792 3 s.h.
16:2 Western Civilization Since 1792 3 s.h.
16:5 Civilizations of Asia 3 s.h.
16:6 Civilizations of Asia 3 s.h.
16:10 Problems in Human History: Foundations of Science from Copernicus to Einstein 3 s.h.
16:11 Problems in Human History: The Vietnam War in Historical Perspective 3 s.h.
16:12 Problems in Human History: Communities and Society in History 3 s.h.
16:13 Problems in Human History: The Political Left in Modern History 3 s.h.
16:14 Problems in Human History: European Conquest and Colonization, 1000-1800 3 s.h.
16:15 Problems in Human History: Women and Society in Past Times 3 s.h.
16:16 Problems in Human History: The Cold War 3 s.h.
16:17 Problems in Human History: Twentieth Century Crisis 3 s.h.
16:18 Problems in Human History: Modern Imperialism 3 s.h.
16:19 Problems: Modernization 3 s.h.
16:20 Problems in Medieval Society 3 s.h.
20:30 Roman Civilization 3 s.h.
20:116 The Concept of the City: Rome 3 s.h.
25:144 History of Music I 3 s.h.
25:146 History of Music II 3 s.h.
26:33 Philosophy and Human Nature 3 s.h.
26:34 Philosophy and Human Nature 3 s.h.
32:1 Judeo-Christian Tradition 3 s.h.
32:4 Living Religions of the East 3 s.h.
32:131 History of Christianity to 1500 3 s.h.
32:132 History of Christianity 1500-Present 3 s.h.
39:16 Introduction to Asian Art 3 s.h.
39:55 Civilizations of Asia 3 s.h.
39:56 Civilizations of Asia 3 s.h.
39:64 Living Religions of the East 3 s.h.
49:2 Theatre and Society 3 s.h.
113:12 Introduction to Prehistory 3 s.h.

Foreign Students and the Historical Perspectives Requirement

In addition to the courses listed above, foreign students who hold nonimmigrant student visas may use the following courses to satisfy the historical perspectives requirement:

16A:61 American History 1492-1877 3 s.h.
16A:62 American History 1877-Present 3 s.h.

Humanities

Students must complete 8G:1 The Interpretation of Literature (3 s.h.) and at least 6 additional semester hours from the courses listed below.

1H:1 Understanding the Visual Arts 3 s.h.
1H:2 The Art of Tribal Cultures 3 s.h.
1H:4 Masterpieces of World Art 3 s.h.
8:40 Major Texts in World Literature I 3 s.h.
8:41 Major Texts of World Literature II 3 s.h.
8G:2 Biblical and Classical Literature 3 s.h.
8G:3 Medieval and Renaissance Literature 3 s.h.
8G:4 Epic and Tragic Literature 3 s.h.
8G:5 The Forms of Comic Vision 3 s.h.
8G:6 Narrative Literature 3 s.h.
8G:7 Lyric Poetry 3 s.h.
8G:8 Literature of the Theater 3 s.h.
8G:9 American Lives 3 s.h.
8G:11 The Personal Voice 3 s.h.
8G:12 Comic and Tragic Literature 3 s.h.
8G:14 Literatures of the African Peoples 3 s.h.
8G:15 Women and Literature 3 s.h.
13:17 German Heroic and Erotic Literature of the Middle Ages 3 s.h.
13:101 Introduction to Modern German Literature I 3 s.h.
13:102 Introduction to Modern German Literature II 3 s.h.
13:118 The Third Reich and Literature 3 s.h.
13:154 Human Nature and the Impact of Science 2-4 s.h.
13:183 The Faust Tradition in Western Civilization 3 s.h.
14:13 The Classical Views 3 s.h.
14:103 Women in Antiquity 3 s.h.
14:107 Ancient Views of Justice 3 s.h.
14:108 Greek Drama in Translation 3 s.h.
14:112 Classical Mythology 3 s.h.
20:113 Religion and the Occult in Antiquity 3 s.h.
25:13 Masterpieces of Music 3-4 s.h.
25:14 Masterpieces of Music 3-4 s.h.
25:103 World Music I 3 s.h.
25:104 World Music II 3 s.h.
26:61 Introduction to Philosophy 3 s.h.
26:102 Introduction to Ethics 3 s.h.
30:30 Introduction to Political Thought and Political Action 3 s.h.
32:2 Religion and Society 3 s.h.
32:3 Quest for Human Destiny 3 s.h.
32:10 Introduction to Religious Studies 3 s.h.
32:15 New Testament Survey 3 s.h.
32:51 Religious Thinkers of the West 3 s.h.
32:111 Religion and Women 3 s.h.
32:164 Religion and the Occult in Antiquity 3 s.h.
33:121 The Good Society 2-4 s.h.
33:154 Human Nature and the Impact of Science 2-4 s.h.
33:161 Form and Milieu in the Arts 2-4 s.h.
35:20 Contemporary Latin American Narrative 3 s.h.
36B:51 Survey of Film 3 s.h.
36B:146 European Film History 3 s.h.
36B:148 National Cinema 3 s.h.
38:20 Contemporary Brazilian Narrative 3 s.h.
39:18 Asian Humanities: India 3 s.h.
39:19 Asian Humanities: China 3 s.h.
39:20 Asian Humanities: Japan 3 s.h.
39:50 Non-Western Literary Traditions 3 s.h.
45:1 American Values 3 s.h.
45:30 Introduction to Afro-American Culture 3 s.h.
48:40 Major Texts in World Literature I 3 s.h.
48:41 Major Texts of World Literature II 3 s.h.
48:50 Non-Western Literary Traditions 3 s.h.
49:1 Art of the Theatre 3 s.h.
49:191 Greek Drama in Translation 3 s.h.
104:25 Humanistic Perspectives on Leisure and Play 3 s.h.
129:8 Literatures of the African Peoples 3 s.h.
129:61 Introduction to Afro-American Culture 3 s.h.
131:111 Religion and Women 3 s.h.
137:40 Art of Dance in Contemporary Society 3 s.h.
141:14 Literatures of the African Peoples 3 s.h.

Natural Sciences

Students must complete at least 7 semester hours from the courses listed below. At least one course taken to fulfill this requirement must include a laboratory component, indicated by "(Lab)."

2:1 Introduction to Botany (Lab) 4 s.h.
4:5 Technology and Society 3 s.h.
4:5 Technology and Society (Lab) 4 s.h.
4:7 General Chemistry I 3 s.h.
4:8 General Chemistry II 3 s.h.
4:13 Principles of Chemistry I 3 s.h.
4:14 Principles of Chemistry II 3 s.h.
4:16 Principles of Chemistry Lab I (Lab) 2 s.h.

11:21 Human Biology (offered only through Guided Correspondence Study) 3 s.h.
11:21 Human Biology (Lab) 4 s.h.
11:22 Ecology and Evolution 3 s.h.
12:1 Lectures in Earth History and Resources 2 s.h.
12:4 Evolution and the History of Life (Lab) 4 s.h.
12:5 Introduction to Geology (Lab) 4 s.h.
12:6 Evolution of the Earth (Lab) 4 s.h.
12:14 Lectures in Evolution and the History of Life 2 s.h.
12:23 Earth History and Resources (Lab) 4 s.h.
12:24 Introduction to Environmental Geology (Lab) 3-4 s.h.
29:5 Chemistry and Physics of the Environment 3 s.h.
29:8 Basic Physics 3 s.h.
29:8 Basic Physics (Lab) 4 s.h.
29:11 College Physics (Lab) 4 s.h.
29:12 College Physics (Lab) 4 s.h.
29:17 Introductory Physics I (Lab) 4 s.h.
29:18 Introductory Physics II (Lab) 4 s.h.
29:50 Modern Astronomy 3 s.h.
29:50 Modern Astronomy (Lab) 4 s.h.
29:51 Introductory Astronomy Laboratory (Lab) 1 s.h.
29:61 General Astronomy (Lab) 4 s.h.
29:62 General Astronomy (Lab) 4 s.h.
37:1 Introductory Animal Biology (Lab) 4 s.h.
37:3 Principles of Animal Biology (Lab) 5 s.h.
37:40 Biology of the Brain 3 s.h.
37:81 Human Genetics 3 s.h.
44:3 Introduction to Physical Geography (Lab) 4 s.h.
113:13 Human Origins 3 s.h.

Transfer Credit in Natural Sciences

Seven or more semester hours of acceptable course work at another college or university satisfies the requirement. Students who transfer fewer than 7 semester hours of course work in natural sciences must complete one of the approved laboratory courses listed above if the transfer work does not include one.

Credit by Examination in Natural Sciences

Until fall semester 1991, students who earn 8 semester hours on the CLEP natural science general examination have satisfied the requirement. Students who earn 3 or 4 semester hours by APP or CLEP applicable to the natural sciences area must complete a course with a laboratory component.

Effective fall semester 1991, students who pass both subtests of the CLEP natural science general examination will be awarded 3 semester hours of credit toward the natural sciences requirement and 3 semester hours of elective credit. These students must complete the natural sciences requirement by taking a course with a laboratory component.

Quantitative or Formal Reasoning

This requirement may be satisfied by completing one of the courses listed below or by completing a more advanced course that has one of these courses as a prerequisite. Students should fulfill the requirement by the end of the second year in residence or during the first 60 semester hours of study at The University of Iowa.

7P:25 Elementary Statistics and Inference 3 s.h.
22M:10 Finite Mathematics 4 s.h.
22M:11 Introduction to Calculus with Applications 4 s.h.
22M:15 Mathematics for the Biological Sciences 4 s.h.
22M:16 Calculus for the Biological Sciences 3 s.h.
22M:17 Quantitative Methods I 4 s.h.
22M:19 Elementary Functions 3 s.h.
22M:25 Calculus I 4 s.h.
22M:35 Engineering Calculus I 4 s.h.
22M:45 Accelerated Calculus I 4 s.h.
22S:2 Statistics and Society 3 s.h.
22S:8 Quantitative Methods II 4 s.h.
22S:25 Elementary Statistics and Inference 3 s.h.
26:36 Principles of Reasoning 3 s.h.
36C:40 Theory and Practice of Argument 3 s.h.
103:13 Language and Formal Reasoning 3 s.h.

Social Sciences

Students must complete at least 6 semester hours from the courses listed below.

6E:1 Principles of Microeconomics 4 s.h.
6E:2 Principles of Macroeconomics 4 s.h.
7F:120 Politics of Education 3 s.h.
16:71 Social Science Perspectives on Contemporary Africa 3 s.h.
16A:60 Introduction to Afro-American Society 3 s.h.
19:90 Social Scientific Foundations of Communication 3 s.h.
30:1 Introduction to American Politics 3 s.h.
30:30 Introduction to Political Thought and Political Action 3 s.h.
30:40 Introduction to the Politics of the Industrial Democracies 3 s.h.
30:41 Introduction to the Politics of Communist Systems 3 s.h.
30:42 Introduction to the Politics of the Third World 3 s.h.
30:50 Introduction to Political Behavior 3 s.h.
30:60 Introduction to International Relations 3 s.h.
30:61 Introduction to American Foreign Policy 3 s.h.
30:146 African Development 3 s.h.
31:1 Elementary Psychology 3-4 s.h.
31:3 General Psychology (either 31:1 or 31:3 may be used) 4 s.h.
31:13 Introduction to Clinical Psychology 3 s.h.
31:14 Introduction to Child Psychology 3 s.h.
31:16 Introduction to Mental Processes 3 s.h.
31:17 Introduction to Comparative Psychology 3 s.h.
34:1 Introduction to Sociology: Principles 3 s.h.
34:2 Introduction to Sociology: Problems 3 s.h.
36B:25 Mass Media and Mass Society 3 s.h.
36C:60 Communication Theory in Everyday Life 3 s.h.
44:1 Introduction to Human Geography 4 s.h.
44:11 Introduction to Social Geography 3 s.h.
44:19 Contemporary Environmental Issues 3 s.h.
44:30 Introduction to Economic Geography 3 s.h.
44:161 African Development 3 s.h.
47:1 Global Interdependence and Human Survival 3 s.h.
103:11 Language and Society 3 s.h.
104:59 Social Scientific Perspectives on Leisure and Play 3 s.h.
113:3 Introduction to the Study of Culture and Society 3-4 s.h.
113:10 Anthropology and Contemporary World Problems 3 s.h.
113:14 Language and Human Behavior 3 s.h.
113:119 Urban Anthropology 3 s.h.
129:60 Introduction to Afro-American Society 3 s.h.
129:71 Social Science Perspectives on Contemporary Africa 3 s.h.
141:71 Social Science Perspectives on Contemporary Africa 3 s.h.
141:146 African Development 3 s.h.

General Education Restrictions and Waivers

Pass/Nonpass: No course used to satisfy any of the General Education Requirements may be taken pass/nonpass.

Courses from the major department: Students may use approved courses from their major department to satisfy the General Education Requirements. Courses approved by the college are listed above.

No more than three courses from one department: Students may use no more than three approved courses from any one department to satisfy the General Education Requirements in all areas except physical education and foreign language. In satisfying the physical education or foreign language requirement, students may use up to four approved courses from a single department.

Departmental waivers of General Education Requirements: Departmental waivers are not permitted for B.A. or B.S. candidates. However, with the approval of the Educational Policy Committee, departments may waive up to 7 semester hours of General Education Requirements for their B.F.A. and B.M. candidates in the area closest or most relevant to the students' programs. Approved waivers are listed in the current *Schedule of Courses* and in the departmental sections of the *Catalog*.

Placement and Exemption Examinations for General Education

Satisfactory performance on tests administered at The University of Iowa may lead to full or partial exemption from the rhetoric, mathematics, physical education, or foreign language requirements. Academic credit is not awarded.

Exemption and/or academic credit may be awarded for satisfactory scores on examinations administered by the Advanced Placement Program (APP) and the College-Level Examination Program (CLEP) in the following General Education Requirement areas: rhetoric, foreign language, historical perspectives, humanities, natural sciences, quantitative or formal reasoning, and social sciences. Specific information about the application of credit for APP and CLEP is available from the Evaluation and Examination Service.

Transfer Students

Transfer students who have taken courses elsewhere that are similar to those approved for general education at Iowa may count these courses toward the General Education Requirements. Acceptance of these courses is shown on the student's admission graduation progress report. Students who transfer fewer than enough hours to meet a General Education Requirement may use only approved courses to complete the remainder of the requirement.

Students with A.A. Degrees

Students who receive A.A. degrees from Iowa Area Community Colleges participating in the Iowa Community College/Regents Articulation Agreement are considered to have met all the General Education Requirements except foreign language. However, the program of study for which the A.A. degree was awarded must include the following:

A minimum of 60 semester hours (90 quarter hours) of credit acceptable toward graduation; mathematics courses comparable to 22M:1 Basic Algebra I, 22M:2 Basic Algebra II, and 22M:3 Basic Geometry are not accepted toward graduation.

Completion of the agreed-upon group of courses at the community college.

A grade-point average of at least 2.00.

Students who use the provisions of the articulation agreement are granted a maximum of 62 semester hours of credit from all sources toward the 124 semester hours required for a bachelor's degree at Iowa. If a student has earned more than 62 semester hours of credit in completing the A.A. degree, the excess credit is used in computing the grade-point averages and may be used to satisfy course requirements, but the excess credit does not count toward the bachelor's degree.

Representatives from the community colleges and the Regents universities meet annually to review the provisions of the articulation agreement.

Restrictions and Limits on Semester Hours Applied Toward a Degree

A maximum of 16 semester hours of credit with a grade of P (pass) and 16 with a grade of S (satisfactory) is accepted toward the 124 semester hours required for graduation.

Students who enrolled at The University of Iowa for the first time before summer session 1987 may count a maximum of 16 semester hours of credit through the second-grade-only option toward graduation, but only through May 1992. After that, they will be limited to a maximum of three courses.

Students who enroll(ed) at The University of Iowa for the first time summer session 1987 and after may apply the second-grade-only option to a maximum of three courses.

A maximum of 30 semester hours of credit by correspondence from all approved sources is accepted toward the 124 semester hours required for graduation. B.L.S. students are not subject to this restriction.

A maximum of 32 semester hours of credit by examination from all approved sources is accepted toward the 124 semester hours required for graduation.

A maximum of 30 semester hours of credit earned in other colleges of the University may be accepted toward the 124 semester hours required for graduation from the College of Liberal Arts. Undergraduate courses in the College of Education are exempt from this rule.

After a student has earned 62 semester hours of college credit from all sources, no more credit is accepted by transfer from a two-year college toward meeting the 124 semester hours required for graduation. If a student has earned more than 62 semester hours of credit from a two-year college, the credit and grades are used in computing the grade-point averages and may be used to satisfy course requirements, but the credit does not count toward the total hours needed for graduation.

A maximum of 50 semester hours of credit from one academic department is accepted toward a B.A. or B.S.; 62 toward a B.F.A.; and 40 toward the B.G.S. or B.A. in interdepartmental studies. This includes both University of Iowa and transfer course work.

Candidates for the B.G.S. or B.A. in interdepartmental studies may count no more than 18 semester hours of advanced course work from any one department toward the 36-semester-hour advanced course requirement.

A maximum of 20 semester hours of ROTC credit is accepted toward the 124 semester hours required for graduation.

Courses without Degree Credit

Courses 10:8, 10:9, 10:89, 22M:1, 22M:2, and 22M:3 carry no degree credit. Students who take these courses must complete additional semester hours beyond the 124 required for graduation. In addition, courses used to make up deficiencies in the unit (admission) requirements carry no degree credit.

Although some courses carry no degree credit, grades awarded in them are used in computing grade-point averages, and the hours count toward semester loads for all official purposes (e.g., full-time and half-time status, maximum schedule, minimum semester-hour requirement, reasonable academic progress, dean's list eligibility, and so forth).

Requirements for the Major

Specific requirements for majors offered in the College of Liberal Arts are listed in the departmental sections of the *Catalog*. Students should confer with their advisers in outlining plans for a major.

A maximum of 50 semester hours of credit from one academic department is accepted toward a B.A. or B.S. degree; 62 toward a B.F.A.; and 40 toward the B.G.S. or B.A. in interdepartmental studies. This includes both University of Iowa and transfer course work. Special considerations for double majors are described below.

Departments have different policies on the acceptance of transfer credit toward the requirements for a major. Students are advised to check with their major department.

Courses in the major department may not be taken on a pass/nonpass basis except by departmental action for courses that are not to be applied toward the major. This restriction applies to both University of Iowa and transfer course work. Courses required for the major in cognate or related areas may be taken pass/nonpass, if available, at the discretion of the major department. S (satisfactory) grades may be earned in the major.

A maximum of 16 semester hours of credit by examination may be awarded in the major.

Double Majors

Students may earn a single bachelor's degree with two or more majors if they meet the requirements for each major and if the departments or programs offer the same degree in the College of Liberal Arts. For example, a student may earn a B.A. in history and English or a B.S. in psychology and sociology.

When a single department offers a degree in more than one subject area (such as physics and astronomy or Spanish and Portuguese), students may earn a double major, a major and a minor, or two minors involving these degree programs. All students must earn a minimum of 56 semester hours in courses taken outside that department.

Students seeking double majors in the programs within the Division of Mathematical Sciences (actuarial science, computer science, mathematics, and statistics) must earn a minimum of 56 semester hours in courses taken outside the division.

Students seeking double majors in the teacher education programs must earn a minimum of 56 semester hours in courses taken outside the College of Education.

Returning for a Second Major

Students who already have earned a B.A. or B.S. degree from The University of Iowa and who are not enrolled in a graduate or professional program may complete the requirements for a second major. These students must apply for readmission to the College of Liberal Arts, declare the appropriate major on their application, and register as seniors (A4).

Students who return to the University to complete a second major must meet only the requirements of that second major; they need not meet the residence requirement. It is the student's responsibility to apply to graduation analysis in the Office of the Registrar upon completion of the requirements for the second major so that a notation can be placed on the permanent record.

Students may return to the University to complete the requirements for a second major developed out of their liberal arts minor.

Minors

Liberal Arts Minors

Students graduating from the College of Liberal Arts may earn a minor or minors in any degree-granting program in the college outside of their major field or in another college of the University. The minor may relate directly to the major or may allow a student to follow an interest entirely different and separate from the major.

Requirements

The requirements outlined below are the general requirements for a minor in the College of Liberal Arts. Requirements for specific minors are described in the departmental sections of the *Catalog*.

A minimum of 15 semester hours must be taken in the minor department or program.

At least 12 of the 15 semester hours must be taken at The University of Iowa in advanced courses acceptable to the academic unit granting the minor. Neither transfer credit nor credit by examination is accepted toward the 12 semester hours of advanced work. Students should check with the minor department to identify acceptable courses.

Students must have a grade-point average of at least 2.00 in all work attempted in the minor department or program.

No course accepted toward the minor may be taken pass/nonpass.

Guidelines

Each academic unit determines which of its advanced courses it considers acceptable for a minor. Students seeking information about acceptable courses should contact the minor departmental office.

Some programs in the college that do not offer a bachelor's degree offer minors. For example, minors may be earned in aging studies, global studies, Latin American studies, and women's studies.

Students inform the Office of the Registrar of their desire to have a minor listed on their record when they apply for a degree. If the student has completed the requirements for a minor, a notation is placed on the permanent record.

Students who already have earned a bachelor's degree from The University of Iowa and have not entered a graduate or professional program may complete the requirements for a minor and apply to the Office of the Registrar to have a notation regarding the minor placed on their permanent record.

Course work applied toward the minor also may be used to satisfy the General Education Requirements.

Course work applied toward the minor also may be used to satisfy cognate requirements for the major. Cognate requirements are those courses outside of the major department that are required as part of the major.

University of Iowa Guided Correspondence Study courses are acceptable toward the minor.

Restrictions

Course work applied toward a minor may not be used to satisfy the requirements for a major. (Students earning minors in Latin American Studies are an exception to this rule. They may count up to 6 semester hours from their major department towards the minor.)

Course work applied toward a minor may not be used to satisfy the requirements for another minor.

Candidates for the B.G.S., B.A. in interdepartmental studies, or B.L.S. are not eligible to earn minors.

The following degree-granting programs do not offer minors: biochemistry; dental hygiene; elementary education; health occupations education; interdepartmental studies; literature, science, and the arts; science education; social studies; and speech and hearing science.

Liberal Arts Minors for Students in Business Administration, Engineering, Medicine, and Nursing

Undergraduate students in the Colleges of Business Administration, Engineering, Medicine, and Nursing may earn liberal arts minors by satisfying College of Liberal Arts requirements for minors. Engineering students interested in minors in physics, chemistry, or mathematics may not use courses required in the engineering curriculum to satisfy the minor requirements in these three areas. (For other restrictions, see appropriate college sections of the *Catalog*.)

Minor in Business Administration

Students in the College of Liberal Arts may elect a minor in business administration. The courses listed below satisfy all requirements for the minor. At least 15 semester hours of courses taken for the minor must be completed at The University of Iowa. A grade-point average of at least 2.00 is required in all courses taken for the minor and in all of these courses taken at Iowa.

A computer programming course (6K:70, 22C:7, 22C:9, 22C:16, 22C:17, or 57:6)	3 s.h.
Business calculus (22M:16, 22M:17, 22M:25, or 22M:35)	3 s.h.
Statistics (7P:143, 22S:8, 22S:39, 22S:102, 22S:120, or 31:142)	3 s.h.
6E:1 Principles of Microeconomics	3 s.h.
6E:2 Principles of Macroeconomics	3 s.h.
6A:1 Introduction to Financial Accounting	3 s.h.
6A:2 Managerial Cost Accounting	3 s.h.
6J:47 Introduction to Law	3 s.h.
*6M:100 Introduction to Marketing	3 s.h.
*6F:100 Introductory Financial Management (or 57:14)	3 s.h.
*6J:100 Administrative Management	3 s.h.

*Must be taken in junior or senior year

Accelerated Professional Track

For superior students in the College of Liberal Arts who plan to continue for a Master of Business Administration (M.B.A.) degree at The University of Iowa, the accelerated professional track offers an alternative to the business minor. Students pursue an undergraduate degree in a field other than business while taking M.B.A. foundation courses. Upon receiving the bachelor's degree, students enter the Graduate College to complete the M.B.A.

degree. More information is available from the Academic Programs Office, College of Business Administration, 121 Phillips Hall.

Minors in Education

Liberal arts students who are pursuing the B.A. or B.S. degree may earn minors in the College of Education. The four minors offered by the College of Education are educational psychology, general education, human relations, and science education. For specific requirements, call or visit the Office of Student Services in the College of Education.

Registration

Registration Period

The final two weeks of the fall and spring semesters are the designated periods for registration. Students register according to a rotation based on the last three digits of their identification number and on the number of semester hours earned. The first four days of the rotation are reserved for students who have earned 72 or more semester hours; students with fewer than 72 semester hours earned register during the remainder of the period.

Late Registration

Students are not permitted to register after the third week of the semester or the first one and one-half weeks of the summer session.

Classification of Students

Rank	Semester hours earned	Code
Freshman	0-29	A1
Sophomore	30-59	A2
Junior	60-89	A3
Senior	90 or more	A4
Special (nondegree) student		A9

Changes in Registration Initiated by the Student

Adding and Dropping Courses

During early registration, students need only an adviser's approval to change courses selected earlier in the registration period. Once classes have begun, courses may be added during the first three weeks of the semester (or the first one and one-half weeks of the summer session) with the signatures of both the adviser and instructor on a Change of Registration form. Courses may be dropped at any time during the first ten weeks of the semester (or first five weeks of the summer session) with the approval of the adviser and the instructor.

Special courses that meet on a different schedule or that start or end at times other than the beginning and end of the semester, and are so listed in the *Schedule of Courses*, may be added with the necessary signatures at any time during the first one-fifth of the course's duration and dropped at any time during the first two-thirds of the course's duration. Proportionately similar deadlines operate during the usual eight-week summer session and for other special session courses.

Withdrawn (W)

Undergraduate students are assigned the grade of W (withdrawn) for any course in any college dropped after the third week of the semester (or first one and one-half weeks of the summer session).

For courses that start or end at times other than the beginning and end of the semester, students may drop the course any time within the first one-fifth of the course's duration without being assigned a W.

Limits on Withdrawing from Courses

Liberal arts students may not drop the same course with the grade of W more than twice. Those who do so are placed on disciplinary probation.

Liberal arts students entering the University Fall 1991 and after will be limited to an overall maximum of five Ws. All other liberal arts students will be limited to a maximum of five Ws beginning with their fall semester 1994 registration.

Freshmen entering the University directly from high school with no prior full-time college experience are permitted to exclude Ws they take during their first two sessions of enrollment from the maximum allowed.

Students who have a legitimate reason for dropping a course (e.g., disabling illness, death of an immediate family member) and can document that reason are permitted to exclude that drop from the maximum. Requests for such exclusions must be made in the Office of Academic Programs, 116 Schaeffer Hall.

Adding and Dropping Courses Late

Students who wish to add or drop courses after the deadlines may do so only with the signature of the associate dean for academic programs in addition to the signatures of the adviser and instructor. Students may request permission for the dean's signature in the Office of Academic Programs, 116 Schaeffer Hall. Approval to add or drop courses late is granted only in extraordinary circumstances and only with appropriate documentation.

Changes in Variable and Arranged Credit

Students who have registered for courses offered for variable or arranged credit may change the number of semester hours according to the rules for adding and dropping courses. Students may increase the number of hours during the first three weeks of the semester (or first one and one-half weeks of the summer session) and may decrease the number during the first ten weeks of the semester (or first five weeks of the summer session). To change the number of semester hours, a student drops the course and adds it for the desired hours.

Withdrawal of Registration

Students may withdraw registration at any time before the end of the twelfth week of the semester or sixth week of the summer session. No credit is given for the semester or session. Students who withdraw registration may not be reinstated after the deadline for that session. Withdrawal cards may be obtained in the Office of the Registrar.

Student Responsibility

Students must initiate changes in registration, obtain the proper signatures on the proper forms, and deliver the forms to the Registration Center before the deadlines. The confirmation that changes have been made is the revised computer printout generated at the Registration Center.

Instructor's Option to Drop for Nonattendance

To provide vacancies in crowded classes, instructors may drop students who have not attended any class session during the first eight calendar days of the semester (or first four calendar days of the summer session), unless the students have offered acceptable reasons for beginning the course late. This provision is for the benefit of students who otherwise would be unable to enroll in certain crowded classes; it should not be used when these circumstances do not exist. These drop actions are made without the assignment of a W. The Registration Center notifies each student dropped from a course and the student's adviser.

Students should not assume that they have been dropped automatically from a course because they have not attended it.

Auditing Courses

Students in the College of Liberal Arts may audit a course (reduce to zero the number of semester hours) if approval is granted by the instructor of the course and the adviser.

Instructors assign the mark of R (registered) if the student's attendance and performance are satisfactory; if they are unsatisfactory, the mark of W (withdrawn) is assigned. Courses offered only for zero credit are graded R/W. Courses offered for zero credit as well as for credit hours, when taken for zero credit, are graded R/W. Audited courses completed with a mark of R do not meet college requirements and carry no credit toward graduation.

Students may register as auditors only at the Registration Center.

During early registration: Students list the course on the registration form and enter "0" in the semester hours column, and the instructor signs in the special permission section on the back of the registration form; or students may add the course for zero credit on a Change of Registration form with the signature of the instructor.

Once classes have begun: Students add the course for zero credit on a Change of Registration form with the signatures of the instructor and adviser.

Changes from credit to audit or from audit to credit must be made within the first three weeks of the semester (or first one and one-half weeks of the summer session), using a Change of Registration form and obtaining the necessary signatures. No changes are accepted after the deadline.

Maximum Schedule

The maximum permitted registration is 18 semester hours during a semester, 9 semester hours during a summer session. Students in good academic standing may request permission to register for more hours than the maximum allowed in the Office of Academic Programs, 116 Schaeffer Hall.

To qualify for full-time status for purposes of tuition assessment, and so forth, students must register for 12 semester hours during a fall or spring semester or 6 semester hours during a summer session. The recommended schedule for students who wish to complete a degree in eight semesters (four years) is 15-16 semester hours each semester.

Graduation Analysis

A graduation analysis evaluates the progress a student is making toward a particular degree by checking total hours earned, grade-point averages, hours in residence, and courses completed to satisfy the General Education Requirements and requirements in the major. Students who are currently enrolled in the College of Liberal Arts and who have declared a major receive a graduation analysis during their junior year. Ordinarily, students do not receive another graduation analysis until their final semester.

Graduation progress reports, which are sent to students each semester they are enrolled, assess fulfillment of General Education Requirements, calculate grade-point averages, and provide a summary of courses taken. The reports do not evaluate progress toward the major.

Duplication

Duplication occurs when students take the same course more than once or take a course that duplicates the content of a satisfactorily completed course. Duplication is assessed by the Office of the Registrar at the time of graduation analysis. Hours earned by duplication do not count toward the total numbers of hours required for graduation. Grades for both courses, however, are used in computing grade-point averages.

Regression

Regression occurs when students take a lower-level or prerequisite course after having satisfactorily completed a more advanced course in the same or related subject. At the time of graduation analysis, the Office of the Registrar determines whether regression has occurred. Hours earned by regression do not count toward the total number of hours required for graduation.

Application for Degree

To be considered for graduation, students must file an application for a degree with the Office of the Registrar before the deadline for the session in which the degree is to be conferred. Students who want to have a minor listed on their permanent record must inform the Office of the Registrar when they file the degree application, so that completion of the requirements for the minor can be verified.

Grading

Grading System

The following grading system is used in the College of Liberal Arts.

Grade (Definition)	Grade points
A+	4.33
A (superior)	4.00
A–	3.67
B+	3.33
B (above average)	3.00
B–	2.67
C+	2.33
C (average)	2.00
C–	1.67
D+	1.33
D (below average)	1.00
D–	0.67
F (failing)	0

*I = Incomplete
*N = Nonpass
*O = No Grade Reported
*P = Pass
*R = Registered
*S = Satisfactory
*W Withdrawn

*Not used in computing GPA

Policies for Plus-Minus Grading

The grading system was expanded to include plus and minus grades effective with grades reported for the summer session 1988. The following policies govern the use of plus-minus grading in the College of Liberal Arts.

The use of plus and minus is optional: departments and individual instructors are free to use the old system (with the grades of A, B, C, D, F) or the new system (which permits the assignment of plus and minus). Within either system, instructors may use any or all of the points on the grading scale.

The grading system used by an instructor must be applied to all students in a given class.

The grading system must be the same in all sections of a multisection course.

Instructors should announce at the beginning of the semester or summer session the grading system to be used in the class.

Grade-Point Average (GPA)

The cumulative grade-point average (GPA) is computed by:

(a) multiplying the number of semester hours in each course by the appropriate grade points;

(b) totaling the grade points earned to date; and

(c) dividing the sum in (b) by the number of hours undertaken, excluding courses in which grades of I, N, O, P, R, S, or W have been given.

Grades of F are included in hours attempted and are used in computing the GPA. Although grades of A+ have a value of 4.33 in calculating a student's GPA, the cumulative GPAs displayed at the bottom of the permanent record are truncated so as not to exceed 4.00.

Incomplete (I)

Instructors may report a grade of I (incomplete) only if the unfinished part of the student's work, in a course other than in research, thesis, or independent study, is small; the work is unfinished for reasons acceptable to the instructor; and the student's standing in the course is satisfactory. Courses may not be repeated to remove incompletes. Incomplete grades must be removed by completing the unfinished part of the work.

The work must be completed and submitted to the course instructor three and one-half weeks before the close of the examination period of the next session for which the student is registered, except that students with incompletes from the spring semester are exempt from the need to complete the work during the succeeding summer session. Failure to remove the I by that date results in an F being assigned for each incomplete.

No Grade Reported (O)

A grade of O is assigned by the Office of the Registrar when an instructor fails to report a grade or reports an invalid grade.

The O designation on a student's permanent record must be changed to a valid grade according to the procedures for incompletes described above. Failure to remove the O by the designated deadline will result in an F being assigned for each O.

Pass/Nonpass Option (P/N)

Students in the College of Liberal Arts have the option of taking elective courses on a P/N basis. The instructor assigns a standard letter grade, which is converted automatically in the Office of the Registrar. Grades of A+, A, A-, B+, B, B-, C+, C, and C- are converted to P; grades of D+, D, D-, and F are converted to N.

The grades of P and N are not used in computing the grade-point averages; the grade of N does not count as hours earned for graduation.

Students may register for P/N beginning the first day of classes through the end of the third week of the semester (first one and one-half weeks of the summer session). For courses that start or end at times other than the beginning and end of the semester, students may register for P/N at any time during the first one-fifth of the duration of the course. The signatures of both the instructor and the adviser must be obtained on a P/N form, and the form must be submitted to the Registration Center before the deadline. A P/N registration may not be changed after the deadline.

Restrictions

Students on academic probation may not use the P/N grading option.

P/N grading may be used in elective courses only. Courses used to satisfy the General Education Requirements may not be taken P/N. Course work in the major department is not available on a P/N basis, except by departmental action for courses that are not to be applied toward the major. This restriction applies to both University of Iowa and transfer course work. Courses required for the major in cognate or related areas may be taken P/N, if available, at the discretion of the major department. No course accepted toward the minor may be taken P/N.

A maximum of 16 semester hours of P grades from all colleges is accepted toward the bachelor's degree. Transfer students admitted to the University with fewer than 60 semester hours of credit may earn the maximum of 16 semester hours of P grades. Those admitted with 60 or more semester hours are limited to 8 semester hours.

A maximum of two P/N courses may be taken in any session.

Satisfactory/Fail Grading (S/F)

Certain courses in the College of Liberal Arts are offered S/F and are so designated in the *Schedule of Courses*. All students registered for these courses receive either an S or an F.

The grade of S is not used in computing the grade-point averages, but the grade of F is used. Credit with the grade of S may be applied toward the General Education Requirements or toward requirements in the major or minor. The grade of F does not count as hours earned for graduation.

Special forms are not necessary to register for S/F courses, since all students enrolled in such courses automatically receive either an S or an F.

A maximum of 16 semester hours with the grade of S is accepted toward the bachelor's degree.

Second-Grade-Only Option

Students may repeat courses taken at The University of Iowa, unless obvious regression is involved, and have only the grade and credit of the second registration used in calculating total hours earned as well as The University of Iowa cumulative and total cumulative grade-point averages. Under the provisions of this option, the Office of the Registrar marks the permanent record (with the symbol #) to show that a particular course has been repeated. Both grades remain on the permanent record, but only the second one is used in calculating the grade-point averages and hours earned.

Students who wish to use this option register in the usual manner for the course they decide to repeat or add it during the regular period for adding courses (the first three weeks of the semester or the first one and one-half weeks of the summer session). Students also must file for the option in the Office of Academic Programs, 116 Schaeffer Hall. Unless this is done, both grades continue to be counted in the grade-point averages.

Restrictions

The second-grade-only option may be used only for University of Iowa courses, including courses in the Saturday and Evening Class Program, telecourses, and off-campus courses. A course taken at another college or university may not be repeated at The University of Iowa under the second-grade-only option, nor may a UI course be repeated at another institution.

The option may be used only once per course.

The option may not be used if obvious regression has occurred.

If the course was taken for a grade the first time, it must be taken for a grade the second time. If the course was taken pass/nonpass the first time, it may be taken pass/nonpass or for a grade the second time.

A course taken through regular registration may not be repeated through Guided Correspondence Study (GCS) under the second-grade-only option. A course taken through GCS may be repeated through GCS or regular registration.

Students who enrolled at The University of Iowa for the first time before summer session 1987 may apply this provision to a maximum of 16 semester hours until May 1992. After that, they will be limited to a maximum of three courses.

Students who enroll(ed) at The University of Iowa for the first time summer session 1987 and after may apply this provision to a maximum of three courses.

Mid-Semester Reports

At mid-semester, instructors are asked to report grades for students whose work is below C-. The Office of the Registrar distributes these reports to advisers and to individual students, but delinquent grades are not recorded on the permanent record.

Grading Grievances

Grading grievances should be resolved with the instructor who assigned the disputed grade. If the student and instructor cannot resolve the matter, the student should discuss it further with the departmental executive officer or faculty member supervising a multisection course. The departmental executive officer may refer unresolved grading grievances to the associate dean for academic programs.

The Office of Academic Programs publishes a handout on grading grievances, which describes the procedures and restrictions.

Academic Probation and Dismissal

Students in the College of Liberal Arts are expected to maintain satisfactory academic standards and to demonstrate reasonable progress toward a degree. Probation serves as a warning that students will not graduate unless their academic performance improves.

Probation

Through Summer 1992

Students must achieve the following minimum University of Iowa and total cumulative grade-point averages or they are placed (or continued) on probation.

Freshmen (0-29 s.h.): 1.60

Sophomores (30-59 s.h.): 1.75

Juniors (60-89 s.h.): 1.90

Seniors (90 or more s.h.): 2.00

Special students (A9): 2.00

Beginning Fall 1992

Effective fall semester 1992, all liberal arts students will be held to the following standards:

Freshmen (0-29 s.h.): 1.70

Sophomores (30-59 s.h.): 1.85

Juniors (60-89 s.h.): 2.00

Seniors (90 or more s.h.): 2.00

Special students (A9): 2.00

Students on academic probation are restored to good standing if their University of Iowa and total cumulative grade-point averages equal or exceed the grade-point averages designated above.

The pass/nonpass (P/N) grading option may not be used by students on academic probation; however, S/F courses are allowed.

Entering freshmen and transfer students may be admitted on probation if they fail to meet the minimum stated standards for admission (see "Admission Requirements," below).

Dismissal

Freshmen admitted unconditionally (not on probation) are subject to dismissal from the college after one semester on academic probation. Freshmen admitted on probation are subject to dismissal after two consecutive semesters on academic probation. Continuing students are subject to dismissal after two consecutive semesters on academic probation. Very poor academic work in any semester, however, may result in dismissal at the close of that semester.

Right to Appeal

Students who can document that their unsatisfactory academic records were the result of extenuating circumstances may appeal for a revocation of a dismissal. A student dismissed in January must appeal in writing no later than 4:30 p.m. on the second day of spring semester classes. A student dismissed in May must appeal in writing no later than June 15. Detailed information on the appeals procedure is available in the Office of Academic Programs. Appeals should be addressed to the Student Appeals Committee, Office of Academic Programs, 116 Schaeffer Hall. The decision of the committee is final. No appeals are considered for revocation of a dismissal that would permit enrollment in a summer session.

Reinstatement to the College

Students dismissed for unsatisfactory scholarship for the first time are not permitted to register again for one year. Students dismissed a second time are not permitted to register for at least two years. Requests for reinstatement must be made in writing or in person and should be addressed to the assistant director, Office of Academic Programs, 116 Schaeffer Hall. Arrangements for a reinstatement interview must be made and the interview must take place between March 1 and July 15 for reinstatement to a fall semester or between October 1 and December 15 for reinstatement to a spring semester. Late requests are deferred to the following semester.

Students who are permitted to register after the specified interval following a dismissal are registered on academic probation and ordinarily are allowed two semesters to achieve good standing. Very poor academic work in the first semester of a reinstatement, however, may result in dismissal at the close of that semester.

Notification and Records

Students placed on academic probation, continued on academic probation, or dismissed from the college are notified in writing of these actions by the associate dean for academic programs. Students admitted on probation have the notation "admitted on probation" entered on their permanent records. The notation "on academic probation" is placed on the permanent records of those students who have been placed or continued on academic probation. "Not permitted to register" is entered on the permanent records of students who have been dismissed from the college. When reinstatement has been granted, "permitted to register" for a particular semester or session is entered on the permanent record.

Class Attendance, Final Examinations, and Student Conduct

Class Attendance

Individual instructors, course chairs, or departments determine the policy on class attendance. Students are required to observe the regulations as announced for the course. However, University policy requires that students be permitted to make up examinations missed because of illness, mandatory religious obligations, or other unavoidable circumstances or University activities.

Excused Absences

For permission to be absent from class to participate in authorized University activities, students are expected to present to each instructor before each absence a written statement signed by a responsible official specifying exactly the dates and times it is necessary to miss class. Excused absences are granted to members of athletic teams, the marching band, debate teams, and other recognized University groups and to participants in University field trips. Participation in the National Guard also is considered an authorized activity.

Students who are absent for medical or personal reasons are expected to present evidence to verify the reason. Students report absences from class of five days or less by completing an "Explanatory Statement of Absence from Class" form, available at the Registration Center, and by presenting the forms to instructors. Students who are absent for more than five days may request the Registration Center to send notification of the absence to each instructor.

Final Examinations

A suitable period for the administration of examinations is set aside at the end of each semester, during which time no classes are held. With the exception of any changes authorized by the associate dean for academic programs, all final examinations must be given according to the schedule as announced in the *Schedule of Courses*. During the summer session, there is no designated final examination period; final examinations are scheduled before the official end of the summer session, either during a regular meeting time or at a time determined by the instructor of the course in consultation with the students in the class.

For a more complete discussion of policies governing final examinations, see the college's *Classroom Manual*.

Student Conduct

Plagiarism and Cheating

All cases of plagiarism and cheating in the college should be reported to the Office of Academic Programs. The instructor and departmental executive officer may decide to reduce the student's grade in the course, even to assign an F. The departmental executive officer gives a written report of the facts in the case and the action taken by the instructor and may submit a recommendation for additional disciplinary action.

The associate dean for academic programs or the Committee on Student Academic Conduct may impose, as the offense may warrant, the following or other penalties: disciplinary probation, suspension from the college, or recommendation of expulsion from the University by the president.

Forgery

The Code of Student Life prohibits forgery of University records, documents, or student identification cards. The Office of Academic Programs interviews students suspected of forgery and takes disciplinary action based on the interview and verification provided by the adviser or instructor.

Misconduct

Students who are disruptive in a classroom or laboratory may be dealt with summarily by the instructor or referred to the dean of student services. The instructor reports in writing to the dean of student services any disciplinary action undertaken against a student.

Recognition for Academic Achievement

Dean's List

Liberal arts students who achieve grade-point averages of 3.50 or above during a given semester on 12 or more semester hours of graded work (excluding University of Iowa Guided Correspondence Study courses) and who have no hours of I (incomplete) or O (no report) are recognized by inclusion on the Dean's List for that semester, and a notation to that effect is entered on the student's permanent record.

Graduation Honors

High scholastic achievement is recognized upon graduation in two ways: graduation with distinction, based upon grades only; and graduation with honors in a particular field, based on both grades and the completion of special work as outlined by the college and the major department.

To be eligible for either form of recognition, students must complete the final 60 semester hours in residence in the College of Liberal Arts at The University of Iowa, of which at least 45 semester hours must have been completed prior to the student's final registration.

Graduation with Distinction

The Office of the Registrar certifies to the dean of the college the names of students eligible to graduate with distinction. The college awards degrees "with highest distinction" to students in the highest two percent of the graduating class, "with high distinction" to students in the next highest three percent, and "with distinction" to the next highest five percent. Ranking is based on students' grade-point averages for all college-level study undertaken prior to the final registration.

Graduation with Honors

The director of the College of Liberal Arts Honors Program certifies to the dean of the college the names of graduating students eligible to graduate "with honors." To be eligible, students must be recommended by their major department and be approved by the Honors Council and the dean of the college.

Admission Requirements

Students are admitted to the College of Liberal Arts on the basis of three criteria: completion of a set of high school unit requirements; high school class rank or college transfer grade-point average; and ACT/SAT results or a combination of high school/college records and standardized test scores. Some programs within the College of Liberal Arts have selective admission procedures. Admission to these programs is based on grades in specified prerequisite courses, the cumulative grade-point average, and other criteria.

The University of Iowa requires all freshmen and transfer students who present fewer than 24 semester hours of transferable credit to complete either the American College Test (ACT) or the Scholastic Aptitude Test (SAT) and have their scores reported to the University before they register for classes. These examinations are used as a criterion for admission, for placement purposes, for advising, and for awarding University-administered scholarships and loans.

Applicants whose native language is not English must present scores on the Test of English as a Foreign Language (TOEFL).

Unit Requirements

The faculty of the College of Liberal Arts recognizes the need for entering students to be prepared for college course work immediately upon matriculation at the University. Students who enter with a strong college preparatory curriculum have a better chance to succeed academically and are more likely to be admitted to the degree program of their choice.

To qualify for unconditional admission to the College of Liberal Arts, applicants are required to have completed the following set of high school courses or their equivalents, in addition to the other requirements listed below. These high school unit requirements apply to entering freshmen who graduate(d) from high school after 1985; transfer students with fewer than 24 semester hours of transferable credit who graduate(d) from high school after 1985; and transfer students with 24 or more semester hours of transferable credit who graduate from high school in 1990 or after.

- Four years of English/language arts, with emphasis on writing, speaking, and reading as well as understanding and appreciation of literature;
- Three years of mathematics (two years of algebra and one year of geometry are required);
- Two years of a single foreign language;
- Three years of natural science (two years must be chosen from biology, chemistry, and physics); and
- Three years of social studies (American history, anthropology, economics, geography, government, world history, psychology, and sociology).

The following preparation is not required but is strongly recommended for admission to the College of Liberal Arts.

- One year of the visual arts, performing arts, and/or humanities (cinema, dance, drama, music, photography, studio art, theater, visual arts, and survey courses in the arts and humanities);
- A fourth year of mathematics (analytic geometry, trigonometry, or calculus); and
- An additional two years of the same foreign language.

Students whose high school curriculum did not provide the courses necessary to complete the unit requirements or who experienced difficulties in scheduling the required courses may apply to the director of admissions for an exception.

Entering Freshmen

Entering freshmen with deficiencies in the unit requirements may be offered conditional admission to the College of Liberal Arts if they meet the high school class rank or test score requirements for admission. As a condition of admission, such students are required to complete specified college-level courses with a grade of C- or better. With prior approval of the Office of Admissions, these courses may be taken at an accredited college, university, or community college. Credit earned in these courses does not count toward graduation from The University of Iowa. If the courses are taken at The University of Iowa, it is usually during the summer session immediately preceding fall enrollment. In all cases, courses taken to remove deficiencies must be completed by the beginning of the student's second year of study at The University of Iowa.

Applicants whose high school verifies in writing that a two-year sequence of the same foreign language was not available to them at their high school are offered conditional admission if they meet all other unit, high school class rank, and test score requirements. They must complete without degree credit specified college-level foreign language courses with a grade of C- or better.

Courses taken to remove deficiencies do not count toward the General Education Requirements, with the exception of rhetoric and foreign language.

In general, one semester of college work in a core curriculum area (3 s.h. or 4 quarter hours) is required to remove a deficiency of one year or less of high school credit.

Transfer Students

Transfer students with A.A. degrees from Iowa community colleges participating in the Iowa Community College/Regents Articulation Agreement are considered to have fulfilled the unit requirements.

Other transfer students may use college courses taken elsewhere to make up high school deficiencies. Courses must be completed with a grade of C- or better and the credit does not count toward graduation from The University of Iowa. Courses taken to remove deficiencies do not count toward the General Education Requirements, with the exception of rhetoric and foreign language.

Removal of Deficiencies through Testing

Deficiencies in mathematics or foreign language may be removed by satisfactory scores on proficiency examinations administered by The University of Iowa. Applicants also may remove deficiencies in English, mathematics, natural science, or social studies by earning acceptable scores on approved standardized tests.

Entering Freshmen

Applicants seeking admission as entering freshmen must have the high school from which they graduated provide a certificate of high school credits, including a complete statement of high school record, class rank, and certification of graduation. Applicants may be admitted tentatively after they have completed the junior year in high school, but admission is not final until receipt of the final transcript and certification of high school graduation.

Graduates of approved Iowa high schools who are in the upper one-half of their graduating class generally are admitted after certification of graduation.

Graduates of accredited high schools in other states who are in the upper 30 percent of their graduating class generally are admitted after certification of graduation.

Applicants who do not meet the high school class rank criteria are admitted if they meet a minimum admission index, which is calculated by multiplying the ACT composite score by two and adding the percentile rank in class. A comparable index is used for students who submit SAT instead of ACT scores. The minimum index for admission varies from year to year. For Iowa residents it ranges from 90 to 100 and for nonresidents from 100 to 110.

Applicants who do not meet these standards may be considered for admission based on other characteristics that indicate definite promise of success. At the discretion of the admissions officer, such students may be admitted unconditionally, admitted on probation, required to enroll for a trial period during a preceding summer session, or denied admission.

Graduates of nonapproved high schools must submit all data required above and must take examinations that demonstrate their general competence to do successful college work.

Admission without High School Graduation

Applicants who are not high school graduates must submit all data required above, take examinations to demonstrate general competence to do college work, and provide evidence of specific competence for admission to a given curriculum.

Transfer Students

Transcripts of records are given full value if they come from colleges or universities accredited by the North Central Association of Colleges and Secondary Schools or similar regional associations. The recommendations contained in the current issue of the *Report of Credit Given by Educational Institutions*, published by the American Association of Collegiate Registrars and Admissions Officers, is followed for schools not regionally accredited.

Applicants must submit an official transcript from each college or university they have previously attended. Applicants also must submit high school transcripts, scores on standardized tests, and any other records or letters the College of Liberal Arts may require to support their applications for admission.

Transfer applicants who have a minimum of 24 semester hours of graded credit from regionally accredited colleges or universities and who have maintained a grade-point average of 2.25 (based on a 4-point system) on all college work previously attempted, are admitted.

Students with fewer than 24 semester hours of college credit are considered for admission based on a combination of high school and college academic records and scores on the ACT or SAT.

In general, transfer applicants under academic suspension from the last college attended are not considered for admission during the period of suspension, or if suspended for an indefinite period, are not considered until one year has passed since the last date of attendance.

Transfer applicants under disciplinary suspension are not considered for admission until a clearance and a statement of the reason for suspension from the previous college are filed. When it becomes proper to consider an application from a student under suspension, the college must take into account the previous suspension. Applicants granted admission under these circumstances are admitted on probation, and their admission is subject to cancellation.

Transfer Students from Nonaccredited Colleges

The College of Liberal Arts may refuse to recognize credit from a nonaccredited college or may admit the applicant on a conditional basis and provide a means for the validation of some or all of the credit. The validation period is not less than one semester; ordinarily it is a full academic year. The college specifies to the student the terms of the validation process at the time of conditional admission. Students from nonaccredited colleges are considered on their own merits, and admission or rejection is at the discretion of the admissions officer.

Non-Native Speakers of English

The University of Iowa has an English proficiency requirement to assure that non-native speakers know English well enough to study without being hindered by language problems, to understand lectures, and to participate successfully in class discussions. For that reason, applicants whose native language is not English are required to submit scores on the Test of English as a Foreign Language (TOEFL) along with their applications for admission and supporting academic documents. Automatic waivers from this policy are granted to persons who already have received a baccalaureate or equivalent degree from a university in the United States, the United Kingdom, Canada (excluding French Quebec), Africa (English-speaking), Australia, or New Zealand.

Foreign Students

Foreign applicants who present TOEFL scores below 530 are not considered for admission to the College of Liberal Arts. Admitted applicants whose TOEFL scores are 600 or higher may begin academic course work with no restrictions. Applicants whose academic credentials indicate that they should be admitted but whose TOEFL scores fall between 530 and 599 may be offered admission to the College of Liberal Arts. However, placement in regular academic courses is made only after the student's English language proficiency has been evaluated using on-campus testing.

U.S. Citizens and Permanent Residents

U.S. citizens and permanent residents whose native language is not English are required to submit scores on the TOEFL before registering for courses. Exceptions to this requirement are made in the cases of:

- Graduates of Iowa high schools whose ACT composite score is 24 or above (SAT combined score of 980 or above) and whose ACT English subscore is 21 or above (SAT 430); and
- Nonresidents of Iowa whose ACT composite score is 25 or above (SAT combined score of 1020 or above) and whose ACT English subscore is 21 or above (SAT 430).

Admitted applicants whose TOEFL scores are 600 or above may begin academic course work without restriction. Those whose TOEFL scores fall below 600 are required to sit for additional English language proficiency testing before they register for courses.

Applicants seeking exceptions are directed to the coordinator of English as a Second Language.

English Proficiency Evaluations

On-campus proficiency evaluations are conducted by the Department of Linguistics. If such evaluation warrants, students are required to enroll either in credit-granting courses in English as a Second Language or in the noncredit Iowa Intensive English Program until their language proficiency reaches the appropriate level. Once such proficiency has been established, students are allowed to take a full academic course load, exclusive of English as a Second Language courses. Such students may begin their academic course work only upon the written recommendation of the coordinator of English as a Second Language. (Courses for non-native speakers of English are described under "Linguistics" in this section of the *Catalog*.)

Special (Nondegree) Students

Students may be admitted to the college as nondegree candidates. These students are classified as special students (A9) and may enroll in courses for personal enrichment, to prepare for admission to professional or graduate college, or to complete a specified technological certificate program. Students enrolled in courses as special students are subject to the rules of the college for academic probation and dismissal. Courses taken by special students may not be used to satisfy the residence requirement for a baccalaureate degree from the College of Liberal Arts.

Re-Entry

Students who have been absent from the University for 12 months or more must apply to the Office of Admissions for re-entry. Students who have been absent for less than 12 months are not required to file an application for re-entry; they should report directly to the Registration Center to begin the registration process.

Students who have been enrolled in another college or university after leaving The University of Iowa are required to submit official transcripts along with their application for re-entry.

Completed application materials must be received two weeks before the opening of classes. Applications received after that date are considered on an individual basis.

Students who have been dismissed from the college for unsatisfactory scholarship have earlier deadlines and must complete an interview in the Office of Academic Programs. See "Reinstatement to the College" under "Academic Probation and Dismissal" in this section of the *Catalog*.

Credit for Military Service

The admissions officer is authorized to evaluate transcripts from the military services according to the recommendations contained in the American Council on Education's *Guide to the Evaluation of Experiences in the Armed Forces*, with the understanding that any inconsistencies between such recommendations and the standards of the College of Liberal Arts will be referred to the Office of Academic Programs. Armed Forces Institute correspondence courses may be accepted for credit under appropriate circumstances.

Credit by Examination

A maximum of 32 semester hours of credit by examination from all approved sources is accepted toward the 124 semester hours required for graduation. Credit by examination may be used as elective credit or it may be applied toward the General Education Requirements or requirements in the major or minor. Credit awarded through the Foreign Language Incentive Program is considered credit by examination.

Placement and Exemption Examinations for General Education

Full or partial exemption from the requirements in rhetoric, mathematics, physical education, or foreign language may be awarded for satisfactory performance on tests administered at The University of Iowa. In addition, exemption and academic credit may be awarded in most general education areas for satisfactory scores on examinations administered by the Advanced Placement Program (APP) or the College-Level Examination Program (CLEP). See below.

Credit by Examination in the Major or Minor

Departments may administer examinations covering required courses or areas of instruction in the major field and may grant credit with a grade of P for the successful completion of such examinations. The maximum credit by examination that may be awarded in the major field is 16 semester hours. Credit toward graduation is awarded to foreign language majors only for passing examinations covering the third- and fourth-semester level or above.

Credit by examination may not be applied to the 12 semester hours of advanced courses required for the minor.

Advanced Placement Program (APP)

Students who pursue college-level learning while still in high school may use the APP testing program to demonstrate their level of achievement. This program was designed by the College Board to provide a means for colleges and universities to evaluate the college-level preparation of participating students and to provide opportunities for high school students to begin college-level study while still in high school.

Scores earned by students are evaluated to determine whether course credit or advanced placement is warranted. Credit awarded through APP may be applied to the General Education Requirements, to requirements in the major or minor, or to elective credit.

Specific credit policies and further information is available from the University's Evaluation and Examination Service.

College-Level Examination Program (CLEP)

CLEP is an achievement testing program offered by the College Board that allows students to demonstrate college-level competence they may have achieved outside of formal college instructional programs. General examinations cover broad content areas such as the humanities, natural science, and social science; subject examinations cover more narrow ranges of content, as typically dealt with in a single college course. Scores on the general examinations can be used to determine whether students have satisfied all or a portion of the General Education Requirement in the areas(s) covered by the examination(s) taken. Those who earn a high enough score on a subject examination are eligible to receive credit for the corresponding University course.

The CLEP program is administered by The University of Iowa Evaluation and Examination Service. Students who wish to participate in CLEP are encouraged to do so prior to their first enrollment so that test results can be used to plan their first semester schedules.

Specific credit policies and further information is available from the University's Evaluation and Examination Service.

Transfer Credit by Examination

The College of Liberal Arts accepts transfer credit that includes APP and CLEP credit awarded by another institution. Although University of Iowa policies on the application of credit by examination may differ from those of the transfer institution, credit is neither added to nor subtracted from a student's record; however, the way in which the credit is applied may differ.

Validation of Credit

Students with educational experience obtained at a nonaccredited institution or in a formal training program in which there is no standardized procedure for evaluation of credit may request the validation of this credit. The Office of Academic Programs and the department concerned should be consulted for approval to take the appropriate examinations.

Nondepartmental Courses

000:20 Conditioning for Competition **0 s.h.**

000:21 Intercollegiate Athletic Participation **1 s.h.**

000:22 Intercollegiate Athletic Participation **1 s.h.**

10:41, 10:42 Physical Education Skills **1 s.h.**
Basic and advanced instruction in the student's choice from a wide variety of team and individual sports and physical and recreational activities; emphasis on life span sports and activities. See current *Schedule of Courses* for skills sections offered. GER: physical education.

10:45 Fitness and Wellness for Life **2 s.h.**
Lecture material applied to the design of a personalized fitness/wellness program and discussion and laboratory sessions. GER: physical education.

11:21 Human Biology (Lab if taken for 4 s.h.) **3-4 s.h.**
Human evolution, reproduction, genetics, and races; integrated functions of human biological systems from cells to behavior; mankind's place in and problems with the environment; lecture, laboratory, discussion. GER: natural sciences.

11:22 Ecology and Evolution **3 s.h.**
Overview of directions of evolution and diversity of living things, their patterns on Earth, their organization in ecological systems, and dynamics of evolutionary processes; lecture, discussion. GER: natural sciences.

AEROSPACE MILITARY STUDIES

Head: Lt. Col. Gary R. Spivey
Professor: Lt. Col. Gary R. Spivey
Assistant professors: Capt. Mark Dettl, Capt. John Bowers

The Department of Aerospace Military Studies administers the Air Force Reserve Officer Training Corps (AFROTC) at The University of Iowa. AFROTC educates highly qualified students who are working toward a bachelor's degree and commissions them as officers in the United States Air Force.

AFROTC is entirely voluntary, with courses open to all undergraduate and graduate students. The amount of credit earned for AFROTC academic work that may be applied toward a degree varies from college to college at the University.

In order to receive a commission, AFROTC cadets must complete all University requirements for a degree as well as courses specified by the U.S. Air Force.

Prior to commissioning, all AFROTC cadets must complete a course in mathematical reasoning. Cadets on AFROTC scholarships also must satisfy a requirement for an English composition course and for two semesters of a major Indo-European or Asian language. The College of Liberal Arts General Education Requirements minimally satisfy these requirements.

AFROTC offers two-, three-, and four-year programs. Joining the program early gives students the opportunity to try AFROTC without obligations. It also gives them an advantage in the selection process for scholarships and POC membership.

There are three main AFROTC program components: the professional officer course (POC), field training, and the general military course (GMC).

Professional Officer Course

The professional officer course (POC) consists of four 3-semester-hour AFROTC courses. Students accepted into the POC make a commitment to serve a minimum of four years as U.S. Air Force officers. To enter the POC, students must be selected to attend and must successfully complete field training. Students generally take the POC during their last two years in school.

Leadership Laboratory

Leadership laboratory is cadet centered and largely cadet planned. It provides leadership training that improves a cadet's ability to perform as a U.S. Air Force officer. To be considered a cadet, students must be enrolled in an academic class and in a 23A course titled Leadership Laboratory.

Field Training

All POC applicants must successfully complete field training at a U.S. Air Force base during a summer, usually between the sophomore and junior years. There are two types of field training: a four-week course for cadets who have applied to the four-year and three-year programs and a six-week course for two-year program applicants.

Field training consists of aircraft, aircrew, career, and survival orientation; junior officer training; physical training; small arms training; human relations education; and equal opportunity training. The six-week field training provides 60 hours of academic work that a student normally would have taken as a freshman and sophomore.

Students receive authorized pay and allowances when they attend field training.

General Military Course

The general military course (GMC) consists of a 1-semester-hour course and a 23:A course titled Leadership Laboratory during each semester of the freshman and sophomore years. Any student who meets AFROTC qualifications and is in good academic standing with the University is eligible to participate in the GMC.

Special Activities

The Cadet Corps sponsors many social events, including informal parties, formal dinners, and a military ball.

Cadets can join the Arnold Air Society, a national professional honor society dedicated to developing leadership qualities and to serving the community.

The advanced training program is a voluntary program in which selected cadets may go on active duty for two or three weeks during the summer following their junior year. Cadets get "hands-on" experience and receive authorized pay and allowances.

Selected AFROTC cadets may attend airborne training and upon completion wear the army parachute "jump wings."

Financial Aid

Scholarships are available, based on merit, for one, two, two-and-one-half, three, and three-and-one-half years of study. They provide full tuition, a stipend for books, laboratory fees, and $100 per month, tax-free. Applicants are selected on both objective and subjective factors. Students should apply directly to the professor of aerospace studies.

All cadets in the last two years of AFROTC receive $100 per month, tax-free. AFROTC books and uniforms are furnished.

Education Delay

Cadets may request an education delay to postpone entry to active duty until after completion of an advanced degree or professional training program.

Courses

23A:1 AFROTC Leadership Laboratory (LLAB) AS 100-1 **0 s.h.**
A progression of experiences designed to develop leadership ability; includes military customs and courtesies, drill and ceremonies, military professional development, and the life and work of a junior officer; leadership skills in a practical, supervised military lab setting. Offered spring semesters. Corequisite: 23A:11.

23A:2 AFROTC Leadership Laboratory (LLAB) AS 200-2 **0 s.h.**
See 23A:1. Offered fall semesters. Corequisite: 23A:20.

23A:3 AFROTC Leadership Laboratory (LLAB) AS 200-3 **0 s.h.**
See 23A:1. Offered spring semesters. Corequisite: 23A:21.

23A:4 AFROTC Leadership Laboratory (LLAB) AS 300-4 **0 s.h.**
See 23A:1. Offered fall semesters. Corequisite: 23A:130.

23A:5 AFROTC Leadership Laboratory (LLAB) AS 300-5 **0 s.h.**
See 23A:1. Offered spring semesters. Corequisite: 23A:131.

23A:6 AFROTC Leadership Laboratory (LLAB) AS 400-6 **0 s.h.**
See 23A:1. Offered fall semesters. Corequisite: 23A:140.

23A:7 AFROTC Leadership Laboratory (LLAB) AS 400-7 **0 s.h.**
See 23A:1. Offered spring semesters. Corequisite: 23A:141.

23A:8 AFROTC Leadership Laboratory (LLAB) AS 700-8 **0 s.h.**
See 23A:1. Offered fall semesters.

23A:9 AFROTC Leadership Laboratory (LLAB) AS 700-9 **0 s.h.**
See 23A:1. Offered spring semesters.

23A:10 The Air Force Today AS 100 **1 s.h.**
Introduction to the United States Air Force: military customs and courtesies, basic oral and written communication techniques, careers available to Air Force officers.

23A:11 The Air Force Today AS 100 **1 s.h.**
Continuation of 23A:10.

23A:20 The Development of Air Power AS 200 **1 s.h.**
Air power from Civil War hot air balloons through World War II; emphasis on developments in the United States Air Force. Prerequisites: 23A:10 and 23A:11.

23A:21 The Development of Air Power AS 200 **1 s.h.**
Continuation of 23A:20.

23A:50 Basic Flight Ground School **3 s.h.**
Prepares students to pass FAA private pilot's written exam; includes study of aircraft systems, aerodynamics, flight instruments, navigation, meteorology, flight planning, and emergency procedures; does not include actual flight training. Offered spring semesters.

23A:99 AFROTC Leadership Laboratory (LLAB) AS 100-0 **0 s.h.**
See 23A:1. Offered fall semesters. Corequisite: 23A:10.

23A:117 Readings in Contemporary Military Issues **1-4 s.h.**
Individual research in historical or contemporary issues related to the military. May be repeated.

23A:130 Management and Leadership AS 300 **3 s.h.**
Consent of instructor required.

23A:131 Management and Leadership AS 300 **3 s.h.**
Consent of instructor required.

23A:140 National Security Forces in Contemporary American Society AS 400 **3 s.h.**
Consent of instructor required.

23A:141 National Security Forces in Contemporary American Society AS 400 **3 s.h.**
Consent of instructor required.

AFRICAN-AMERICAN WORLD STUDIES

Chair: Darwin T. Turner
Professors: Peter Nazareth (English/African-American World Studies), Darwin T. Turner (English/African-American World Studies)
Associate professors: Mae Henderson (English/African-American World Studies), Allen Roberts (Anthropology/African-American World Studies), Fredrick Woodard (English/African-American World Studies)
Assistant professors: James Giblin (History/African-American World Studies), Robert Weems (History/African-American World Studies)
Undergraduate degree offered: B.A. in African-American World Studies
Graduate degree offered: M.A. in Afro-American Studies (cognate concentrations leading to B.A., M.A., and Ph.D. in American Studies)

Because the African-American World Studies Program is interdisciplinary, it draws cooperating faculty from the departments of American Studies, Anthropology, Art, Education, English, French, Geography, History, Political Science, Spanish and Portuguese, Sociology, and Women's Studies.

The African-American World Studies Program focuses on the study of people of African ancestry in the North American colonies and the United States from the seventeenth century to the present. To provide a comprehensive view of that subject, the program also offers courses examining the African heritage and present relationships of African-Americans to Africans in other lands. Because a thorough understanding of Afro-American culture cannot be achieved through study restricted to the perspective of a single discipline, all students in the program are required to pursue courses in both humanities and social sciences. Although the program at present emphasizes history and literature, the African-American World Studies Program continually expands program perspectives by developing or cross-listing courses that fuse the knowledge drawn from many disciplines in the humanities and social sciences.

The program originated in 1969 through courses intended to foster awareness of the role of Afro-Americans in the development of the United States and designed to promote understanding of the present conditions and concerns of Black Americans. Since then, these courses have been organized into a curriculum that includes a program leading to an undergraduate major in African-American world studies, an undergraduate minor in Afro-American studies, a Master of Arts degree in Afro-American studies, and concentrations of Afro-American studies in programs leading to a B.A., M.A., or Ph.D. in American studies. Students seeking Ph.D. degrees in English or history also can organize courses in Afro-American literature or Afro-American history into a special field or cognate area.

Originally called the Afro-American Studies Program, the program was renamed the African-American World Studies Program in 1986. This new name more accurately describes the philosophy and the breadth of the program.

Although most of the students in the Ph.D. program are preparing to work in colleges and universities as teachers and administrators, the B.A. and M.A. programs provide valuable backgrounds for many other students seeking careers in community work, public school teaching, religion, government, and political science. In short, the African-American World Studies Program offers training important to any individual whose career will require understanding and knowledge of Blacks.

Undergraduate Program

Bachelor of Arts

Students earning a Bachelor of Arts degree with a major in African-American world studies will follow either of two programs of study: the Afro-American studies option (30 semester hours) or the African-American world studies option (39 semester hours). A third program of study—an African studies option—is being planned.

The Afro-American studies option focuses on Blacks in the United States and gives some attention to their culture and history in relation to the culture and history of Blacks elsewhere in the world. The African-American world studies option places greater emphasis on the interrelationships of Black history and cultures in various places in the world. Students must earn a grade-point average of 2.00 or higher in all courses in their major program. The curricula are as follows:

Afro-American Studies Option

Total of 30 semester hours

Required Courses

129:60 Introduction to Afro-American Society 3 s.h.
129:61 Introduction to Afro-American Culture 3 s.h.
For majors in the program, these two courses are prerequisite to Afro-American Literature I and II, Afro-American History I and II, and Senior Seminar.

129:116 Afro-American Literature I 3 s.h.
129:117 Afro-American Literature II 3 s.h.
129:165 Afro-American History I, Before 1865 3 s.h.
129:166 Afro-American History II, 1865 to Present 3 s.h.
129:80 Critical Skills Seminar 3 s.h.
129:99 Senior Seminar 3 s.h.

Electives

Students must take 6 semester hours of electives in 129-prefix courses, not including 129:10, 129:175, or 129:176. Students are encouraged to take at least 3 semester hours of these electives in courses focused on Blacks in Africa or in the Caribbean.

Language Requirement

The language requirement for the Afro-American Studies option is the same as the College of Liberal Arts foreign language General Education Requirement for the B.A. degree. See the "College of Liberal Arts" introductory section in the *Catalog*.

African-American World Studies Option

Total of 39 semester hours

Required Courses

129:8 Literatures of the African Peoples 3 s.h.
129:60 Introduction to Afro-American Society 3 s.h.
129:61 Introduction to Afro-American Culture 3 s.h.
129:71 Social Science Perspectives on Contemporary Africa 3 s.h.
For majors, these four courses are prerequisite to the advanced required courses in history and literature and to the Senior Seminar.

129:116 Afro-American Literature I 3 s.h.
or
129:117 Afro-American Literature II 3 s.h.

129:119 African Literature 3 s.h.

129:163 History of Pre-Colonial Africa 3 s.h.
or
129:164 History of Colonial Africa 3 s.h.

129:165 Afro-American History I, Before 1865 3 s.h.
or
129:166 Afro-American History II, 1865 to Present 3 s.h.

Another course in Afro-American history or African history	3 s.h.
129:80 Critical Skills Seminar	3 s.h.
129:99 Senior Seminar	3 s.h.

Electives

Students must earn 6 semester hours of electives in 129-prefix courses, not including 129:10, 129:175, or 129:176.

Language Requirement

The language requirement for the African-American world studies option is four semesters, or equivalent, in any language, other than English, that is regularly spoken in Africa. The languages currently taught at The University of Iowa that satisfy this requirement are French, Portuguese, and Spanish.

Honors

The African-American world studies honors program offers students the opportunity to pursue special interests in individual in-depth research. Honors candidates in African-American world studies must be members of the College of Liberal Arts Honors Program.

Under the guidance of the undergraduate honors adviser, the honors candidate defines a research project using primary sources. Project proposals are made by the end of the candidate's junior year. Each candidate completes a project under the guidance of a supervising faculty member and may register for up to 6 semester hours in 129:95 Honors Project. Results are presented in a senior essay to a committee of three faculty members, including the supervising faculty member, the honors adviser, and a third faculty member of the student's choice. When the honors adviser is the supervising faculty member, the candidate may select second and third faculty members. The candidate's committee may choose to hear an oral defense of the final project, usually in the twelfth week of the student's last semester.

Minor

The African-American World Studies Program offers a minor in Afro-American studies to undergraduate students. The requirements conform to the general requirements for minors in the College of Liberal Arts. In consultation with their adviser, students select 15 semester hours (five courses) in designated African-American world studies courses. Four of these courses (12 semester hours) must be numbered 100 or above. All five must be taken at The University of Iowa.

Students must earn a grade-point average of at least 2.00 in all courses in the minor program. Courses numbered 100 and above may be selected from 129-prefix courses in the list at the end of this section of the *Catalog*, but 129:175 and 129:176 may not be counted toward the minor.

Students who wish to pursue a minor in Afro-American studies should consult with an adviser in the African-American World Studies Program as early as possible. It is recommended that they select an introductory course from the following: 129:8, 129:11, 129:60, 129:61. Advisers also recommend that they choose 129:116 or 129:117, and 129:165 or 129:166 as two of their upper-level courses.

Graduate Programs

Master of Arts

The interdisciplinary curriculum leading to a Master of Arts degree in Afro-American studies provides an intensive, organized, graduate-level examination of Afro-American culture and experience. Such a program especially benefits individuals preparing for community college teaching, work with community-service organizations, or other careers in which an understanding of Afro-Americans may be necessary or helpful.

Curriculum Requirements

The Master of Arts program in Afro-American studies requires 34 postbaccalaureate semester hours. Requirements include 129:211 Introduction to Research in Afro-American Culture (3 s.h.), 129:312 Advanced Research in Afro-American Culture (thesis/project, 4 s.h.), and 12 semester hours of required courses in Afro-American studies.

Most students will be required to earn 12 semester hours in literature/history by taking 129:116 and 129:117 Afro-American Literature I and II and 129:165 and 129:166 Afro-American History I and II. Students who have earned undergraduate or graduate credit for a year-long survey of either Afro-American literature or Afro-American history may satisfy the literature/history requirement by studying advanced Afro-American studies courses approved by their adviser.

To complete the curriculum, students select 15 semester hours of electives in consultation with their advisers. Recommended are courses in Afro-American music, Afro-American art, or African art. All 15 semester hours of electives may be selected from the courses numbered above 100 in the course list below. Students should consult an adviser in the program to determine which courses numbered above 100 will be approved for an M.A. degree.

Because the African-American world studies advisory committee wants to encourage doctoral study for those who have the ability, interest, and resources, it recommends that 6 of the 15 semester hours of electives in the Master of Arts program be used to explore doctoral education in disciplines outside African-American world studies. Possible fields of study are American studies, anthropology, education, English, geography, history, and sociology. Students are encouraged to select at least one-half of the courses in the M.A. curriculum from those numbered above 200.

Language/Tool Requirements

No foreign language or tool is required for the Master of Arts program in Afro-American studies, but students considering doctoral study in another field are encouraged to complete one language/tool requirement for that field while studying at the master's level.

Comprehensive Examinations

Each student is required to pass a written comprehensive examination in Afro-American studies. The comprehensive examination is prepared and evaluated by a committee of faculty members who teach courses in the African-American World Studies Program. A component of the comprehensive examination is based on a reading list prepared and approved by the African-American World Studies Program faculty. An oral examination may be required as a follow-up to the written one.

Thesis/Project Requirements

A thesis is not required, but is an option, for a Master of Arts degree in Afro-American studies. If a student elects to write a thesis, the thesis must explore a topic of Afro-American culture and/or experience and must use research from more than one discipline. The maximum credit for a thesis is 4 semester hours.

Students who do not prepare a thesis are required to develop, in consultation with an adviser, a project related to Afro-American culture and/or experience. When completed, this project must be presented and defended before an appropriate class in Afro-American studies. Credit for the thesis or project usually is earned through registration in 129:312 Advanced Research in Afro-American Culture (4 semester hours).

Admission

In addition to the general requirements of the Graduate College, unconditional graduate admission to the African-American World Studies Program requires that students have an appropriate educational background in literature and the social sciences, at least 6 semester hours of collegiate credit in Afro-American literature and/or history courses, and a minimum grade-point average of 2.70 in previous college courses in Afro-American studies. Students may be asked to take, without credit toward the master's degree, courses needed to remedy deficiencies in undergraduate preparation.

Applicants for admission are expected to provide three letters of recommendation from former professors and a sample of written scholarly work.

Recommendations for admission are made by the admissions subcommittee of the African-American World Studies Program.

Concentration in American Studies Ph.D.

Generally, a student seeking a Ph.D. in American studies with a concentration in Afro-American studies is preparing to be a teacher or research scholar at the college or university level.

Ordinarily, students seeking a concentration in Afro-American studies take a minimum of 36 semester hours of graduate study in African-American world studies, identify two Afro-American studies fields within their plan of study, and write a dissertation on a topic in Afro-American culture. An Afro-American studies field is defined as one in which the majority of courses are drawn from those listed under "Courses" at the end of this section of the *Catalog*. Students interested in such a concentration should consult both the chair of African-American World Studies Program and the chair of American Studies Program for more information.

Cognate Areas, Special Fields

It is possible for students to take concentrations of Afro-American studies courses as cognate areas or special fields in Ph.D. programs in history, English, and other disciplines. For further details, consult an adviser in African-American world studies.

Cocurricular Activities

Black Kaleidoscope

The African-American World Studies Program promotes knowledge and consciousness of Black culture by sponsoring Black Kaleidoscope, a series of lectures and demonstrations by scholars and artists distinguished in Black culture.

Institute in Afro-American Culture

From 1968 through 1978, The University of Iowa served as summer host for an Institute in African-American World Studies for college and university teachers. The institutes, which brought renowned artists and lecturers to the campus, focused on topics such as the Harlem Renaissance, Richard Wright, W.E.B. Du Bois, Black Americans in theater, and slave narratives. Although students in residence at the University are not eligible to be official members of the institute, they are permitted to enroll in a 3-semester-hour course offered at the same time as the institute and on the current year's topic. The program plans to offer institutes in future summers.

Black Action Theater

Academically sponsored through the African-American World Studies Program, Black Action Theater gives participants instruction and experience in theatrical productions of works by Black authors.

Afro-American Cultural Center

The African-American World Studies Program encourages students to use facilities of the Afro-American Cultural Center. The center serves as a museum and library of educational and cultural artifacts and exhibits of Black culture, providing cultural enrichment for Black people of the Iowa City community and a cultural meeting place for Black students. It also attempts to provide a knowledge of Black culture that will promote interracial understanding among all members of the University community. See "Cultural Centers" in the "Student Life at Iowa" section of the *Catalog*.

Black Genesis Troupe

The African-American World Studies Program also encourages participation in Black Genesis Troupe, a student organization that blends dance, music, poetry, and visual arts in representations of Black culture and history.

Graduate Student Association

The African-American World Studies Graduate Student Association attempts to promote interest in Black culture by sponsoring programs on various topics. Any University of Iowa graduate student interested in African-American world studies is eligible to be a member.

Related Courses

Although they are not included in the basic list of courses in the African-American World Studies Program, the following are recommended for interested students. For course descriptions, see the appropriate sections of the *Catalog*.

Anthropology

113:151 Sociology of the Third World 3 s.h.

Art and Art History

1H:190 Themes in Art History: African Crafts arr.
1H:202 Seminar: Problems in African Art 2-3 s.h.

Business Administration

6J:252 Collective Bargaining 3 s.h.

Comparative Literature

48:50 Non-Western Literary Traditions 3 s.h.
48:160 Cultural Identity in Caribbean Literature 3 s.h.

Economics

6E:234 Development Policy and Planning in the Third World 3 s.h.

Education

7F:104 Education in the Third World 2-3 s.h.
7F:130 Educational Sociology 2-3 s.h.
7F:154 Education, Race, and Ethnicity 2-3 s.h.
7P:109 Socialization of the School-Age Child 3 s.h.
7U:133 The Culturally Different in Diverse Settings 3 s.h.

Geography

44:157 Third World Development Support 3 s.h.

History

16A:61 American History 1492-1877 3 s.h.
16A:62 American History 1877-Present 3 s.h.
16A:127 American Intellectual History 1607-1865 3 s.h.
16A:128 American Intellectual History from 1870 3 s.h.
16A:163 United States in the Early Republic 3 s.h.
16A:164 Civil War and Reconstruction 3 s.h.
16A:165 The Gilded Age in America 3 s.h.
16A:166 The Progressive Era in America 3 s.h.
16A:167 The New Era and The New Deal 1920-1940 3 s.h.
16A:168 The Contemporary United States 1940-Present 3 s.h.

Physical Education and Sports Studies

28:156 Minorities in Sports 3 s.h.

Political Science

30:146 African Development 3 s.h.
30:148 The Politics of Southern Africa 3 s.h.
30:150 The Political Economy of the Third World 3 s.h.

Sociology

34:166 Social Inequality 3 s.h.

Social Work

42:147 Racism and Discrimination 3 s.h.

Courses

For Undergraduates

129:000 Cooperative Education Internship **0 s.h.**

129:8 Literatures of the African Peoples **3 s.h.**
Introduction to selected works of twentieth-century Black writers of the United States, the Caribbean, and Africa. GER: foreign civilization and culture, humanities. Prerequisite: 8G:1. Same as 8G:14, 141:14.

129:10 Black Poetry Workshop **3 s.h.**
Black American poetry as background and model for student writers; emphasis on discussion and criticism of poems by students.

129:11 Contemporary Black Experience 3 s.h.
Focus on the 1960s.

129:12 Readings in Prose of Black Writers 3 s.h.
Afro-American narrative types and techniques, from antebellum slave narratives to contemporary fiction.

129:15 Third World Women and Literature 3 s.h.
Selected works by Third World women or featuring Third World women as subjects. Same as 131:15.

129:20 Afro-American Issues 3 s.h.
Interdisciplinary study of topics and problems in Afro-American culture and experience. Same as 45:20.

129:60 Introduction to Afro-American Society 3 s.h.
Social and cultural history of Afro-Americans through a framework of general works in anthropology, sociology, and history. GER: social sciences. Same as 16A:60.

129:61 Introduction to Afro-American Culture 3 s.h.
Interdisciplinary introduction to Black culture in the United States through significant contributions of the humanities—music, art, literature, drama, and philosophy—to the development of Black culture. GER: humanities. Same as 45:30.

129:71 Social Science Perspectives on Contemporary Africa 3 s.h.
Introduction to the study of Africa through social science disciplines such as history, anthropology, politics, and economics. GER: social sciences. Same as 16:71, 141:71.

129:80 Critical Skills Seminar 3 s.h.
Skill development in writing, analysis, and research techniques essential to advanced study. Open only to majors.

129:95 Honors Project arr.
Independent research and writing on an interdisciplinary topic. Consent of instructor required.

129:99 Senior Seminar 3 s.h.
Comparative study of Afro-American, African, and Afro-Caribbean culture and experience intended to synthesize students' earlier studies. Open only to majors in the last year. Consent of instructor required.

Primarily for Advanced Undergraduates and Graduates

129:103 African Drama 3 s.h.
Dramas by contemporary Africans; plays for staging, one-act plays, radio plays. Same as 141:103.

129:107 Art of West Africa 3 s.h.
Same as 1H:107, 141:107.

129:110 Art of Central Africa 3 s.h.
Same as 1H:108, 141:108.

129:112 Problems in American Politics 3 s.h.

129:113 Africans in the New World 3 s.h.
Social and cultural history of Black populations in the New World. Same as 113:113.

129:114 Race and Ethnic Relations 3 s.h.
Multidisciplinary study of intergroup relations; emphasis on social, historical, and political issues in the study of American minority groups. Same as 113:155, 34:155.

129:115 Social Anthropology of the Caribbean 3 s.h.
GER: foreign civilization and culture. Same as 113:118.

129:116 Afro-American Literature I 3 s.h.
Afro-American writers from the eighteenth century to 1940 examined in relation to cultural, social, literary, and historical influences. Same as 8:116.

129:117 Afro-American Literature II 3 s.h.
Literary developments among Afro-Americans from 1935 to present; writers and works in relation to cultural, political, social, and literary influences on Afro-Americans. Same as 8:117.

129:119 African Literature 3 s.h.
Study of the portrayal in fiction of contemporary African states. Same as 8:119, 141:119.

129:120 Images of Black Women in Modern American Fiction 3 s.h.
A study of the characterization and symbolic treatment of the American Black woman by modern writers; includes literature by Black and white, male and female authors. Same as 8:130.

129:121 Readings in Afro-American Culture 3 s.h.
Topics vary when offered as a formal course. May be taken as independent study by advanced undergraduates and graduate students who have completed basic studies of Afro-American culture.

129:124 Black Culture and Experience 3 s.h.
Advanced examination of Black culture and experience, both nationally and internationally, as revealed through the humanities and the social sciences. Primarily for graduate students.

129:127 Black Women Writers 3 s.h.
Study of evolution of Black women's literature in the United States, Caribbean, and Africa; selections taken from various genres. Same as 8:118.

129:128 The Black Woman in America 3 s.h.
History of the Black woman in American society, with particular attention to the relationship between stereotypic images and actual roles. Same as 131:128.

129:130 History of Black Music 3 s.h.
General survey of the history of Black music in America from the seventeenth century to present; emphasis on significant forms, styles, and contributors and their sociological settings. Open to freshmen. Same as 25:106.

129:131 Topics in Black Music 3 s.h.
Selected topics for students interested in work beyond 129:130.

129:133 The Culturally Different in Educational Settings 3 s.h.

129:135 Francophone Literature of the African Diaspora 3 s.h.
Same as 9:163, 141:163.

129:141 Race, Racism, and American Law 3 s.h.
Same as 91:335.

129:151 Race, Ethnicity, and International Relations 3 s.h.
Racial and ethnic conflict, particularly in situations that threaten regional and world balances; world efforts to alleviate these situations. Same as 113:181.

129:157 Peoples and Cultures of Africa 3 s.h.
Ethnography of Africa; what African life is like and how it has been described and understood by outsiders. Same as 113:120, 141:157.

129:158 Myth, Magic, and Mind 3 s.h.
Same as 113:158, 141:158.

129:159 Anthropology of African Art 3 s.h.
Theoretical perspectives and useful methods for studying African art and material culture in cultural and historical context; focus on synthesizing perspectives and methods of anthropology and art history; movies and slides of African art. Same as 113:159, 141:159.

129:162 Women in African History 3 s.h.
Theories about the creation of patriarchy applied to Africa; initiation rituals and gender/gender roles; gender divisions of labor and historical changes in them; women in labor migration systems and their role in reproduction; women and slavery; twentieth century women in urban and peasant societies; female prostitution; women's political movements in South Africa; the 1929 women's tax revolt in Nigeria; women and Islam. Same as 16:124, 131:162, 141:124.

129:163 History of Pre-Colonial Africa 3 s.h.
Survey of the rise, decline, and fall of African kingdoms before European colonialism; political, social, and cultural institutions of these kingdoms. Same as 16:120, 141:120.

129:164 History of Colonial Africa 3 s.h.
Survey from partition by European powers in the last two decades of the nineteenth century to independence in 1960. Same as 16:121, 141:121.

129:165 Afro-American History I, Before 1865 3 s.h.
West Africa and the transatlantic slave trade, Blacks in colonial America, slaves and free Blacks, and the antislavery movement. Same as 16A:185.

129:166 Afro-American History II, 1865 to Present 3 s.h.
African-Americans' quest for rights and privileges under the U.S. Constitution. Same as 16A:186.

129:167 Studies in the Fiction of Afro-Americans 3 s.h.
In-depth study of selected Afro-American novelists; reading list determined by instructor. Prerequisite: at least one semester of an Afro-American literature survey or consent of instructor. Same as 8:152.

129:169 Readings in African Culture 3 s.h.
May be offered as independent study. Same as 141:169.

129:170 Modern African History 3 s.h.
Same as 16:122, 141:122.

129:175 Black Action Theater 3 s.h.
Theory and performance; study of history and theory related to stage presentations or performances by Black Americans; responsibility for Black Action Theater productions. Open to freshmen. Offered fall semesters.

129:176 Black Action Theater 3 s.h.
Same as 129:175, with focus on different plays. Open to freshmen. Offered spring semesters. Same as 49:180.

129:177 Studies in the Poetry of Afro-Americans 3 s.h.
In-depth study of leading Afro-American poets; reading list determined by instructor. Prerequisite: one semester of Afro-American literature or consent of instructor. Same as 8:153.

129:179 Independent Study in Black Culture arr.
Consent of instructor required.

129:180 Afro-American Drama 3 s.h.
Developments in drama by Afro-Americans since 1923. Same as 8:154, 49:195.

129:182 Modern African Novel 3 s.h.
Emphasis on style and thought of representative African authors.

129:184 Selected Black Writers 3 s.h.
Same as 8:184.

129:185 Topical Issues in Afro-American History 3 s.h.
Topics vary. Same as 16A:184.

129:186 Topics in Modern African History 3 s.h.
Topics vary. Same as 16:123, 141:123.

129:187 The History of South Africa 3 s.h.
Political, economic, and social history of South Africa, with focus on the nineteenth and twentieth centuries; development of apartheid, industrialization, and emergence of opposition politics. Same as 16:125.

129:188 Topical Issues in Social Science About Blacks 3 s.h.
Significant issues of the Black experience examined through materials and methods of one or more selected social science disciplines.

Primarily for Graduates

129:210 Readings in the Culture of Black America 3 s.h.
Overview of social, economic, political, and religious experiences that have influenced Black Americans.

129:211 Introduction to Research in Afro-American Culture arr.
Methodologies, bibliographies, issues, and resources significant in a study of Afro-American culture. Consent of instructor required. Same as 45:210.

129:212 Advanced Readings in Black Culture arr.
Seminar on textual, social, and political analyses of works by Black authors; reading list determined by instructor.

129:215 Politics and the Black Writer 3 s.h.
The role of values in the formation of political ideology among selected Black writers.

129:220 Religion and Black Culture 3 s.h.
Interrelationships of Black culture, religions, and philosophies in various parts of the world.

129:221 Analytical Exposition in Afro-American Studies 3 s.h.
Synthesis of primary and secondary research materials for analytical and comprehensive studies in Black culture, in other related graduate courses, and for future publications; for graduate students.

129:225 Seminar Problems in African Art 2-3 s.h.
Same as 1H:202, 141:202.

129:227 Three African Writers 3 s.h.
Same as 8:227, 141:227.

129:228 Blacks in the Literature of Black and White Authors 3 s.h.
Images of Blacks in literature by Black and non-Black writers. Same as 8:228.

129:235 Studies in African Francophone Literature 3 s.h.
Same as 9:240, 141:240.

129:285 Seminar: Afro-American History arr.
Same as 16:285.

129:310 Sources for Study of Afro-American Literature 3 s.h.
Events, folk traditions, folklore, customs, myths, legends, and individuals as sources of allusions in Afro-American literature.

129:312 Advanced Research in Afro-American Culture arr.
Seminar or independent study project for graduate students concentrating in Afro-American studies. Prerequisites: basic courses in Afro-American studies and 129:211.

129:314 Seminar: Advanced Study in Afro-American Drama 3 s.h.
In-depth study of selected Afro-American playwrights or performers. Prerequisite: 129:180 or equivalent or consent of instructor.

129:340 Seminar: Advanced Study in Afro-American Poetry arr.
In-depth study of selected Afro-American poets. May be taken as independent study. Prerequisite: 129:177 or equivalent or consent of instructor.

AFRICAN STUDIES PROGRAM

Coordinator: Joel Barkan (Political Science)
Committee members: Stephen Arum (International Education and Services), Joseph Ascroft (Journalism and Mass Communication), Joel Barkan (Political Science), Sandra Barkan (College of Liberal Arts Honors Program), Jacques Bourgeacq (French and Italian), John Else (Social Work), James Giblin (History), Ab Gratama (Art and Art History), John Howell (University Libraries), Michael McNulty (Geography), Peter Nazareth (English/African-American World Studies), Allen Roberts (Anthropology), Christopher Roy (Art and Art History), Abdi Samatar (Geography), Adrien Wing (Law)

The African Studies Program helps students gain a broader understanding of traditional and contemporary life in Africa, and with the historical and contemporary forces that shape the continent. It fosters an environment of cooperation and collaboration among students and faculty that leads to increased opportunities for teaching and research.

Several established programs and resources at The University of Iowa benefit the African Studies Program. The Stanley Collection of African sculpture at the Museum of Art is central to the program and of enormous benefit to students interested in all aspects of African life. The many contemporary African writers who participate in the International Writing Program strengthen African studies. So do African scholars who come to campus through the Program for International Development and African students who enroll in the School of Journalism and Mass Communication master's program in development support communication. The University also participates in exchange programs with the University of Ouagadougou, Burkina Faso, and the University of Ibadan, Nigeria, established with funds from a United States Information Service grant.

Certificate Program

The African Studies Program provides undergraduate students with an interdisciplinary background in the study of Africa that complements a departmental major and serves as a step toward possible graduate study of Africa.

The curriculum for an undergraduate certificate in African studies includes 21 semester hours of courses on Africa. These are divided into three levels of study: introductory, intermediate, and advanced. Undergraduate students pursuing the certificate take 47:7 Contemporary Africa as an introduction to the continent and its history, art, literature, politics, and peoples, and as an introduction to the Africanist faculty at Iowa. This is followed by 15 semester hours of intermediate (100-level) lecture courses, with at least one course from each of four areas of study: literature, art, history, and social science. Senior students complete the course of study with a seminar or an advanced course on Africa.

Course Requirements

Full descriptions of each of the courses listed below are given in the appropriate departmental sections of the *Catalog*.

Foreign Language Requirement

The language requirement is four semesters or the equivalent of any foreign language spoken in Africa. Languages currently taught at The University of Iowa that meet this requirement are French, Portuguese, and Spanish.

Introductory Course

141:7 Introduction to African Studies 1-3 s.h.

Intermediate Courses

One 3-semester-hour course in each of the following areas (12 semester hours total).

Literature

141:14 Literatures of the African Peoples 3 s.h.
141:103 African Drama 3 s.h.
141:119 African Literature 3 s.h.
129:182 Modern African Novel 3 s.h.
141:163 Francophone Literature of the African Diaspora 3 s.h.

Anthropology

141:157 Peoples and Cultures of Africa 3 s.h.
113:148 Special Topics in Anthropology 3 s.h.

Art

141:107 Art of West Africa 3 s.h.
141:108 Art of Central Africa 3 s.h.
141:190 Themes in Art History: African Crafts 3 s.h.
141:202 Seminar: Problems in African Art 3 s.h.

History

141:120 History of Pre-Colonial Africa 3 s.h.
141:121 History of Colonial Africa 3 s.h.
141:122 Modern African History 3 s.h.

Social Sciences

141:146 African Development 3 s.h.
141:148 The Politics of Southern Africa 3 s.h.
44:162 Planning and Geography of Underdevelopment 3 s.h.
44:262 Political Economy of Regional Development 3 s.h.
44:264 Agrarian Change and Rural Development in the Third World 3 s.h.

Electives

Three semester hours in any of the areas.

Advanced Course/Seminar

Students must take a seminar or an advanced course in any of the four areas listed above (3 semester hours). Among the advanced courses offered are the following:

141:110 African News Colloquium 2 s.h.
141:202 Seminar: Problems in African Art 3 s.h.
141:227 Three African Writers 3 s.h.

Further information on the African Studies Program is available from the Center for International and Comparative Studies, 405 Jefferson Building, The University of Iowa, Iowa City, Iowa 52242.

Courses

141:7 Introduction to African Studies 1-3 s.h.

141:14 Literatures of the African Peoples 3 s.h.
GER: foreign civilization and culture, humanities. Same as 8G:14, 129:8.

141:71 Social Science Perspectives on Contemporary Africa 3 s.h.
GER: social sciences. Same as 16:71, 129:71.

141:103 African Drama 3 s.h.
Same as 129:103.

141:107 Art of West Africa 3 s.h.
Same as 01H:107, 129:107.

141:108 Art of Central Africa 3 s.h.
Same as 01H:108, 129:110.

141:110 African News Colloquium 2 s.h.

141:119 African Literature 3 s.h.
Same as 8:119, 129:119.

141:120 History of Pre-Colonial Africa 3 s.h.
Same as 16:120, 129:163.

141:121 History of Colonial Africa 3 s.h.
Same as 16:121, 129:164.

141:122 Modern African History 3 s.h.
Same as 16:122, 129:170.

141:123 Topics: Modern African History 3 s.h.
Same as 16:123, 129:186.

141:124 Women in African History 3 s.h.
Same as 16:124, 129:162, 131:162.

141:146 African Development 3 s.h.
GER: foreign civilization and culture, social sciences. Same as 30:146, 44:161.

141:148 The Politics of Southern Africa 3 s.h.
GER: foreign civilization and culture. Same as 30:148.

141:157 Peoples and Cultures of Africa 3 s.h.
Same as 113:120, 129:157.

141:158 Myth, Magic, and Mind 3 s.h.
Same as 113:158, 129:158.

141:159 Anthropology of African Art 3 s.h.
Same as 113:159, 129:159.

141:163 Francophone Literature of the African Diaspora 3 s.h.
Same as 9:163, 129:135.

141:169 Readings: African Culture 3 s.h.
Same as 129:169.

141:180 Themes in Art History arr.

141:202 Seminar: Problems in African Art 2-3 s.h.
Same as 01H:202, 129:225.

141:227 Three African Writers 3 s.h.
Same as 8:227, 129:227.

141:240 Studies in African Francophone Literature 3 s.h.
Same as 9:240, 129:235.

AGING STUDIES PROGRAM

Coordinator: Hermine McLeran
Advisory committee chair: Lorraine Dorfman (Home Economics)
Advisory committee: Lorraine Dorfman (Home Economics), Gary Gaeth (Business Administration), Charles Helms (Medicine), Al Hood (Counselor Education), Ron Hunt (Dentistry), James Jakobsen (Graduate College), David Leslie (Exercise Science), James Lindberg (Liberal Arts), George Lopos (Continuing Education), Richard MacNeil (Leisure Studies), Eleanor McClelland (Nursing), Woodrow Morris (Medicine), Hal Pope (Sociology), James E. Rohrer (Hospital and Health Administration), Gerard Rushton (Geography), Richard J. Simon (Psychology), Bernard Sorofman (Pharmacy), Martin Tracy (Social Work), Thomas H. Walz (Social Work)

The Aging Studies Program at The University of Iowa is designed to provide undergraduate and graduate students with a multidisciplinary approach to gerontology. The program consists of courses that have been coordinated and sequenced to provide a broad background in aging for students of various disciplines. All students plan their course of study with their academic advisers in close cooperation with the Aging Studies Program coordinator.

Programs

Certificate

The certificate in Aging Studies requires 18 approved semester hours of course work related to aging at the 100 level or above. This aging-specific course work is defined as University of Iowa courses that focus principally on older persons, the aging process, or interventive methods or techniques whose target is the elderly or aging.

Students are required to take an introductory aging course and complete either a research project or a practicum course. With the approval of their major department, students may apply course work to their major or professional program of study. Six semester hours must be taken outside the major department.

Students should take the introductory aging course prior to, or concurrently with, other courses in the program. The research project or the practicum course should not be taken until the first 9 semester hours of the program are completed.

Eligibility

The program is open to all interested graduate students, upper-level undergraduates who have completed 45 semester hours, and special status students whose career interests and needs are served by completing the program.

Students in good standing at the above-mentioned levels may establish plans of study with the Aging Studies Program coordinator, who works with them and their advisers to shape a plan of study complementary to their academic program and career interests.

Students should contact the aging studies coordinator to develop an appropriate study plan. The program includes required courses and recommends the sequence in which course work should be taken. The coordinator keeps a record of each student's approved program and progress. When a student completes an undergraduate degree and fulfills the requirements for the Aging Studies Program, the coordinator notifies the registrar, who records completion of the program on the student's transcript.

Minor

Undergraduate students in the Colleges of Liberal Arts, Business Administration, Nursing, Engineering, or Education may complete a minor in aging studies by taking 15 semester hours in courses outside of their major department or college that are approved by the program. The minor must be approved by the student's college or department. At least 12 of the 15 semester hours must be taken in advanced courses (100 level or above) at The University of Iowa. Students must have a grade-point average of at least 2.00 in all work in aging studies.

Course Requirements

For full descriptions of each of the courses listed below, see the listings in the appropriate departmental sections of the *Catalog*.

Introductory Courses

All students must take at least one and no more than two introductory courses. The introductory courses accepted in the program include:

17:108 Basic Aspects of Aging 3 s.h.
34:130 Aging and Society 3 s.h.
42:184 Multidisciplinary Perspectives on Aging 3 s.h.
96:129 Introduction to Gerontology 2-3 s.h.

Practicum and Research Courses

At least 3 semester hours in a practicum and/or research course are required and no more than 6 are accepted to meet the requirements of the Aging Studies Program. Practicum and research courses include:

17:000 Cooperative Education Internship 0 s.h.
17:193 Directed Studies arr
42:190 Field Work in Gerontology arr
96:133 Nursing Practice in Chronic Illness (partial credit) 8 s.h.
96:145 Leadership, Management, and Research in Nursing Practice (partial credit) 8 s.h.

Other departmental practicum or research courses are accepted if the content and focus of the course of study is aging-specific.

Elective Courses

Students may take elective courses to meet their particular needs and interests. Additional courses that fulfill the requirements for the program may be selected from the following.

Anthropology

113:136 Aging: A Cross-Cultural Perspective 3 s.h.
113:147 Special Topics in Anthropology: Death, Bereavement, and Ethnicity in Late Life 3 s.h.

Counselor Education

7C:280 Topical Seminar in Counselor Education arr.

Dentistry

112:145 Introduction to Geriatric Dentistry 2 s.h.

Health and Hospital Administration

80:208 Long-Term Care Administration 3 s.h.

Home Economics

17:211 Individual and Family Development: Life Span (partial credit) 3 s.h.
17:219 Seminar: Family or Consumer Studies (Aging and the Family) 2 s.h.

Internal Medicine

78:805 Geriatrics Seminars 1 s.h.

Nursing

96:116 Loss and Death in Clinical Nursing Practice 3 s.h.
96:130 Normative and Psychopathological Aspects of Aging 3 s.h.
96:230 Gerontological Nursing I 4 s.h.
96:231 Gerontological Nursing II 4 s.h.

Physical Education

27:112 Health Promotion and Aging 3 s.h.

Recreation Education

104:146 Contemporary Issues in Recreation and Leisure 3 s.h.
104:162 Aging and Leisure 3 s.h.

104:165 Health Promotion and Wellness for Older Adults 3 s.h.

Religion

32:163 Introduction to Biomedical Ethics (partial credit) 2-3 s.h.
32:193 Suffering, Death, and Faith 2 s.h.

Social Work

42:185 Social Policy and the Elderly 3 s.h.
42:199 Selected Aspects of Social Work and Social Welfare arr.
42:222 Social Policy Issues in Health Care (partial credit) 3 s.h.
42:280 Human Behavior: Selected Aspects arr.

Sociology

34:136 Social Psychology of Aging 3 s.h.
34:230 Sociology of the Family (partial credit) 3 s.h.
34:233 Aging and Human Development 3 s.h.

Speech Pathology

3:165 Communication Disorders and Aging 2 s.h.
3:530 Seminar: Communication Disorders and Aging 2 s.h.

AMERICAN STUDIES PROGRAM

Chair: Richard P. Horwitz
Professors: Wayne Franklin (English/American Studies), Richard P. Horwitz (American Studies), John Raeburn (American Studies/English), Albert E. Stone (American Studies/English)
Associate professor: Lauren Rabinovitz (American Studies/Communication Studies)
Undergraduate degree offered: B.A. in American Studies
Graduate degrees offered: M.A., Ph.D. in American Studies

American Studies draws additional cooperating faculty from the Departments of African-American World Studies, Anthropology, Communication Studies, Economics, English, Geography, History, Home Economics, Leisure Studies, Linguistics, Museum Training, Philosophy, Political Science, Psychology, Sociology, Sports Studies, Theatre Arts, Urban and Regional Planning, and Women's Studies; the schools of Art and Art History, Journalism and Mass Communication, Music, Religion, and Social Work; and the College of Education.

In its course work and for its majors, the American Studies Program provides an interdisciplinary introduction to American culture, past and present. The program helps students and critics of culture acquire a broad familiarity with the dynamics of cultural experience. Students may combine related departmental courses in American experience with the interdisciplinary courses and seminars of the American Studies Program to explore aspects of life in the United States, such as popular and fine arts, institutions, values, gender and ethnic relations, artifacts, and the everyday life of a diverse citizenry.

Undergraduate Program

Bachelor of Arts

The B.A. degree in American studies stresses broad training in cultural analysis and communication. Although there is no explicitly vocational training, the program provides preparation for a career in business, education, government, journalism, or social service; for advanced studies in the humanities, the social sciences, theology, or business; or for professional studies in law or medicine. Internships can be arranged.

With the adviser's assistance and approval, a student majoring in American studies develops an individual plan of study, combining courses from cognate departments and programs with integrative American Studies Program courses to explore a common period, topic, theme, or problem in American cultural experience. The major usually consists of 12 courses totaling 36 semester hours. Students are especially encouraged to complete courses in women's studies and African-American world studies. Courses in American studies must include: 45:1 American Values and 45:90 Seminar in American Cultural Studies. Requirements include:

American studies core (4 courses, including 45:1 and 45:90) 12 s.h.
American history (2 courses) 6 s.h.
Cognate (6 courses in American studies or other departments) 18 s.h.
Total 36 s.h.

General education courses in historical perspectives, humanities, literature, and social sciences provide relevant preparation for the American studies major; 8G:9 American Lives is especially recommended.

Minor

Students interested in a minor in American studies should consult program faculty members. The minor requires a minimum of 15 semester hours of credit in American studies with a minimum grade-point average of 2.00. At least 12 of the 15 semester hours must be taken at The University of Iowa in courses numbered 45:100 and above, but 45:90 also may count toward this requirement.

Honors

The American studies honors program offers students the opportunity to pursue special interests in individual, in-depth research. Honors candidates in American Studies must be members of the College of Liberal Arts Honors Program.

Under the guidance of the undergraduate honors adviser, the honors candidate defines a research project using primary sources. Project proposals should be made by the end of the candidate's junior year. Each candidate completes the project under the guidance of a supervising faculty member and may register for up to 6 semester hours in 45:95 Honors Project. Results of the research project are presented in a senior essay to a committee of three faculty members, including the supervising faculty member, the honors adviser, and a third faculty member of the student's choice. (When the honors adviser is the supervising faculty member, the candidate may select second and third faculty members.) The candidate's committee may choose to hear an oral defense of the final project, usually in the twelfth week of the student's last semester.

Graduate Programs

Master of Arts

The M.A. degree in American studies may be a terminal degree or a degree preliminary to the Ph.D. in American studies or a traditional discipline.

The M.A. program in American studies includes 12 courses usually totaling 36 semester hours. Requirements include:

45:200-201 Theory and Practice in American Studies I-II (6 semester hours) plus at least two other courses (6 semester hours) or seminars in American studies;

Five to eight additional courses selected in relation to a topic or period of cultural history; these courses may be grouped to address more than one topic, and they must be chosen from more than one discipline; they usually include at least two courses in American history and some work in African-American world studies and women's studies; and

Satisfactory performance in 45:400 Masters Preparation (3 s.h.), which includes a comprehensive examination on course work and basic concepts.

The M.A. also may be taken with thesis, in which case a student may receive up to 6 semester hours of thesis credit. Students should consult the program chair for details.

A joint program leading to the M.A. degree in American studies and the J.D. degree from the College of Law provides a broad cultural context for the study and practice of law. Similar joint programs can be arranged in other professional fields, including social work and journalism.

Doctor of Philosophy

The Ph.D. program in American studies requires a minimum of 72 semester hours of course work that provides a core of American studies courses in interdisciplinary methods and substantial course work in three major fields. Requirements include:

Theory and Practice in American Studies (45:200-201) 6 s.h.
First field (6 courses) 18 s.h.
Second field (6 courses) 18 s.h.
Third field (6 courses) 18 s.h.
Electives

Although permitted considerable flexibility in planning a program, American studies candidates must meet certain basic requirements. One is that through course work and reading, all students address the cultural diversity of American life. Since race and gender issues are specifically explored on the oral portion of the comprehensive examination, some course work is required in African-American world studies and women's studies. Students also must design a plan of study that emphasizes a particular period of American cultural history. Hence, history is considered either background to or the center of all doctoral programs. Finally, students must complete significant course work in American studies itself. Graduate students normally must take 45:200-201 Theory and Practice in American Studies consecutively during the first year of graduate study. At least two additional graduate courses in American studies are required. These courses provide interdisciplinary training and background for a position that is required for the Ph.D. comprehensive examination.

Students must work carefully with advisers to be sure each major field is a well-designed dimension of a coherent plan of study.

Admission to Ph.D. Candidacy

A student's plan of study and evaluation by instructors must be presented to the American studies faculty for review after about 30 semester hours of course work have been completed. Students who have been admitted to Ph.D. candidacy should finish the courses approved in the plan of study and prepare for comprehensive examinations.

Comprehensive Examinations

Each field must include at least 6 courses (18 semester hours), including tutorials. In defining a field, students should consider covering not only a body of material, a time period, interpretive theory, comparative studies, or a theme and courses in women's studies and African-American world studies, but also a foreign language, media production skills (e.g., photography, video), and internships.

Comprehensive examination of two of the fields is normally through two four-hour written examinations. The third is tested through an annotated bibliography. The oral portion of the comprehensive examination focuses on the position paper, the two written examinations, and the annotated bibliography.

Thesis

The final requirement for the Ph.D. in American studies is presentation of an acceptable thesis on a topic whose investigation involves more than one field or discipline. The candidate may petition to present a creative thesis, such as fiction, autobiography, or film, combined with a critical analysis of the cultural experiences the thesis reflects. Permission to undertake such a thesis is granted only by the American studies steering committee.

Internships

Qualified graduate students in American studies can arrange internships with a number of local agencies, including the State Historical Society of Iowa, the Division of Historic Preservation, The University of Iowa Museum of Art, the Iowa Humanities Board, Living History Farms, the Herbert Hoover National Historic Site, and the Putnam Museum, Davenport. Other internships in Chicago can be negotiated with Hull House, Newberry Library, Church Council of Chicago, Spertus Museum of Judaica, DuSable Museum of African-American History, and the National Training Institute. With special permission, candidates conducting research during such on-the-job training may receive academic credit through 45:100 Independent Study or 45:350 Material Culture Internships. Other internships in social agencies, government, or business also may be arranged.

Courses

Primarily for Undergraduates

45:000 Cooperative Education Internship **0 s.h.**

45:1 American Values **3 s.h.**
Introduction to American studies via representative texts, artifacts, and cultural values in historical and contemporary perspective. GER: humanities.

45:5 American Issues **3 s.h.**
Topics and problems in American studies.

45:20 Afro-American Issues **3 s.h.**
Interdisciplinary study of topics and problems in Afro-American culture and experience. Same as 129:20.

45:30 Introduction to Afro-American Culture **3 s.h.**
GER: humanities. Same as 129:61.

45:35 Race and Ethnicity in the U.S. **3 s.h.**

45:40 Gender in the U.S. **3 s.h.**
Topics in women's studies such as sex roles and gender relations, feminine and masculine dimensions of American culture. Same as 131:40.

45:42 Women and Work in the U.S. **3 s.h.**
Women in the American workplace, pink collar and housework, gender and the division of labor, sexual harassment, affirmative action. Same as 131:42.

45:44 Lesbian Lives in the U.S. **3 s.h.**
Lesbian experience in America. Same as 131:44.

45:50 Family in the U.S. **3 s.h.**
Family life as a dimension of American cultures, traditional and alternative households, images, narratives, experiences of kinship.

45:60 American Arts **3 s.h.**
Cultural interpretations of literature and visual arts of the United States.

45:65 American Places **3 s.h.**
The American West, the South, images of the city or the road in American culture.

45:70 Popular Arts and Entertainment in the U.S. **3 s.h.**
Rock 'n' roll, jazz, humor, or sport in America.

45:75 American Music **3 s.h.**
Cultural and historical study of rock 'n' roll, jazz, blues, country and western, or folk music.

45:80 Asians Encounter Americans **3 s.h.**
U.S. relations with Asian nations, immigration, international perspectives, Asian-American experiences.

45:85 Cross-Cultural Views of the U.S. **3 s.h.**
The United States in an international context, diplomacy and travel, immigration, cross-cultural perspective and relations.

45:90 Seminar in American Cultural Studies **3 s.h.**
Intensive investigation of a single theme or period in American culture, employing a variety of materials and an interdisciplinary perspective; possible topics include the 1930s, 1960s, concepts of the national character.

45:95 Honors Project **arr.**
Independent research and writing on an interdisciplinary topic.

For Undergraduates and Graduates

45:100 Independent Study **arr.**
Consent of instructor required.

45:108 American Religions and Cultural Change **3 s.h.**

45:110 Literature and Culture of America Before 1800 **4 s.h.**
The formative period in American culture, studied through historical records, artifacts, and the arts; special attention to problems of spatial, political, and social order, and to the psychology of colonialism. Same as 8:141.

45:140 The Cultures of American Women **3 s.h.**
Examination of the variety of women's experience in America with particular reference to the relationship between individual lives and the broad social and cultural content. Same as 131:140.

45:150 Childhood and Youth in America **3-4 s.h.**
Studies in earlier stages of the life cycle, in cultural and historical context.

45:170 Work and Leisure in American Culture **3 s.h.**
Same as 104:122.

45:185 International Views of America **3 s.h.**
Views of American culture and society from varying international perspectives.

45:190 American Autobiography **3 s.h.**
Topics in American cultural life and the life experiences of subculture members as reflected in autobiography, whose complex nature as narrative receives special attention. Same as 8:186.

45:192 American Popular Arts **3 s.h.**
History, interpretation, and criticism of such popular arts as best-selling fiction, the movies, or television.

45:193 American Photography **3 s.h.**
Popular and art photographs as expressions of American life and thought.

45:194 American Film and Video **3 s.h.**
Topics in the history, interpretation, and criticism of movies, television, and video art of the United States.

45:195 American Material Culture **3 s.h.**
Historical and cultural studies of artifacts such as buildings; furniture; decorative arts; agricultural, industrial, and transportation technology.

45:196 American Vernacular Architecture **3 s.h.**
Historical and cultural studies in the vernacular architecture, rural and urban, chiefly of the East, Midwest, and South.

45:197 Landscape **3 s.h.**
Historical survey of the development of land use patterns in rural America, with special attention to cultural values, agricultural traditions, and the impact of modern technology.

45:198 American Communities **3 s.h.**
Interdisciplinary study of an American scene via field work.

45:199 Interviewing Americans **3 s.h.**
Studies of contemporary Americans through interviews, questioning and recording techniques, ethnographic writing. Same as 113:106.

Primarily for Graduates

45:200 Theory and Practice in American Studies I 3 s.h.
Theories, methods, and cases in American culture studies, with special attention to social science approaches; usually a two-semester sequence.

45:201 Theory and Practice in American Studies II 3 s.h.

45:210 Introduction to Research in Afro-American Culture arr.
Same as 129:211.

45:240 Women and Television in American Culture 3 s.h.
Same as 131:240 and 36B:240.

45:250 Seminar in Theories of Culture 3 s.h.

45:260 Seminar: History, Literature, and Culture arr.
Same as 8:465.

45:295 Seminar: American Material Culture 4 s.h.
Theoretical issues in the study of American culture through material objects.

45:300 American Film and American Culture 3 s.h.
In-depth study of the relationships between American film and culture as developed within a particular approach, period, or subject; topics vary. Same as 36B:300.

45:350 Material Culture Internship 0-5 s.h.
Independent study; work in the field or in a field school curating or interpreting material culture.

45:360 American Studies Pedagogy 0-5 s.h.
Independent study; a first teaching experience or preparation of a new course.

45:370 Writing for Publication 0-5 s.h.
Independent study; writing or revision of a paper to be delivered at a scholarly meeting or submitted to a journal.

45:400 Masters Preparation 0-3 s.h.
Independent study; students write the two parts of the M.A. exam. Open only to students seeking an M.A. in American Studies without thesis.

45:450 Masters Thesis 0-5 s.h.

45:500 American Studies Position Paper 3 s.h.
Independent study; students prepare position paper for the Ph.D. comprehensive exam.

45:600 Ph.D. Thesis arr.

ANTHROPOLOGY

Chair: Michael Chibnik
Professors: Thomas H. Charlton, E. Paul Durrenberger, Nora England, June Helm, Mac Marshall, Margery Wolf
Associate professors: Florence E. Babb, Michael Chibnik, Russell Ciochon, Marshall McKusick, Douglas Midgett, Allen Roberts
Assistant professors: James Enloe, Laura Graham, Mariko Tamanoi, Mary Whelan
Adjunct professor: Toni Tripp Reimer
Adjunct assistant professors: Jeffrey Ehrenreich, William Green, Kevin Kelly, Stephen C. Lensink, Ronald Munger
Undergraduate degree offered: B.A. in Anthropology
Graduate degrees offered: M.A., Ph.D. in Anthropology

All human cultures, whether historical or contemporary, simple or complex, are part of anthropology's study. Anthropology provides a framework for understanding the place of human beings in the natural world; their physical and cultural evolutionary background; the organization of social life; cultural and symbolic systems; the evolution of cultures and societies; and the interrelations among society, personality, and shared canons of thought and feeling.

Undergraduate Program

A Bachelor of Arts in anthropology provides a solid foundation for careers in anthropology and in a variety of fields involving work with persons from cultures and subcultures different from one's own. These fields include the health care professions, biological sciences, law, economics, business, political science and government, social work, international affairs, and education.

The major requires at least 30 semester hours of course work in anthropology, including:

113:3 Introduction to the Study of Culture and Society	3-4 s.h.
113:12 Introduction to Prehistory	3 s.h.
113:13 Human Origins	3 s.h.
113:14 Language and Human Behavior	3 s.h.

In addition, students must take one course in archaeology (areal or topical), one course in ethnology, and one course in social institutions. The remaining semester hours should be selected in consultation with the adviser.

Anthropology electives offer a wide range of choices, including courses dealing with language and culture, economic anthropology, religious activity in folk and tribal settings, non-Western art, physical anthropology, human prehistory, human evolution, environment and culture, and urban anthropology.

Specialization is discouraged in the undergraduate program, which is designed to give students the broadest possible cross-cultural background. Course work is encouraged in related areas such as sociology, linguistics, geology, geography, history, art history, psychology, zoology, and statistics. Students also are encouraged to participate in archaeological field and laboratory research and in physical anthropology research.

Honors Program

The honors program in anthropology is open to students with a minimum cumulative grade-point average of 3.20 both overall and in anthropology. In addition to the regular requirements for a major in anthropology, honors students complete a seminar or graduate-level course in anthropology or in a related department and an honors research project. For more information, consult the honors adviser in the Department of Anthropology.

Minor

Students must complete 15 semester hours of credit in anthropology with a minimum grade-point average of 2.00, at least 12 of which must be taken at The University of Iowa in courses numbered 113:100 and above.

Graduate Programs

Master of Arts

The M.A. program consists of three program tracks: general anthropology (thesis or nonthesis), designed to prepare students to deal with any aspect of anthropology at an introductory level; economic anthropology (thesis only); and feminist anthropology (thesis only).

The M.A. program without thesis precludes consideration for admission to the Ph.D. program.

The number of semester hours of credit required for the M.A. with thesis may vary from 30 to 36, depending on the student's previous anthropological training. The nonthesis program requires at least 36 semester hours of graduate work. The department also offers a 38-semester-hour M.A. degree without thesis in anthropology with a concentration in museum training.

No more than 9 semester hours of courses outside of anthropology and no more than 3 semester hours of independent study may be applied toward the M.A. degree requirements in anthropology.

Students with previous training in anthropology, whatever their undergraduate major, may petition for permission to waive any part of the distribution requirements listed below.

The following are the requirements for each M.A. program track.

General Anthropology

(Thesis or nonthesis)
113:102 Anthropological Data Analysis
113:171 Anthropological Linguistics
113:240 Seminar: Sociocultural Anthropology
113:268 Seminar: Archaeological Theory and Method
113:285 Seminar: Biological Anthropology

Total 15 s.h.

Students must also take one additional course in each of two of the following subject areas, for a total of 6 semester hours: sociocultural anthropology (courses listed under "Social Institutions"), linguistics (including appropriate courses in the Department of Linguistics), archaeology (excluding field and laboratory methods courses), or physical anthropology (excluding laboratory courses).

Economic Anthropology

(Thesis only)
113:102 Anthropological Data Analysis
113:240 Seminar: Sociocultural Anthropology
113:268 Seminar: Archaeological Theory and Method

Total 9 s.h.

Students must also take one course from each of the three groups below, for a total of 9 semester hours:

113:135 Work and Society
113:141 Economic Anthropology

113:138 Economic and Political Development: Women's Roles
113:151 Sociology of the Third World
113:275 Development Policy and Planning in the Third World

113:143 Environment and Culture
113:160 Environmental Archaeology
113:164 Comparative Prehistory

Feminist Anthropology

(Thesis only)
113:240 Seminar: Sociocultural Anthropology
113:190 Feminist Perspectives on Biology and Culture
113:220 Seminar: Feminist Anthropology

Total 9 s.h.

Students must also take three courses from the two groups below, with at least one course from each group, for a total of 9 semester hours:

113:138 Economic and Political Development: Women's Roles
113:156 Women's Roles in Cross-Cultural Perspective
113:210 Seminar: Gender in Chinese Society

113:171 Anthropological Linguistics
113:172 Language and Culture
113:201 Seminar: Anthropological Theory
113:268 Seminar: Archaeological Theory and Method
113:285 Seminar: Biological Anthropology

M.A. in Anthropology with Concentration in Museology

In cooperation with the Museum of Natural History, the Department of Anthropology offers a program of study leading to the M.A. degree in anthropology with a concentration in museology. Instruction in the organization and management of museums with emphasis on exhibit design, curation, and educational outreach development forms part of the graduate program.

Required Courses

Anthropology

113:240 Seminar Sociocultural Anthropology	3 s.h.
113:285 Seminar Biological Anthropology	3 s.h.
113:268 Seminar Archaeological Theory and Method	3 s.h.
Electives in anthropology	6 s.h.
Total	15 s.h.

Museum Training

24:103 Museum Laboratory Methods	2 s.h.
24:110 Principles of Exhibit Design	2 s.h.
24:112 Introduction to Museology	2 s.h.
24:113 Introduction to Conservation of Museum Objects	2 s.h.
24:114 Directed Studies and Projects	arr.
24:146 Description and Organization of Materials I	3 s.h.
24:180 Museum Internship	arr.
Total	14 s.h.

Suggested Electives

24:102 Museum Technique
24:104 Museum Laboratory Methods

Other courses in museum training, science education, instructional design and technology, geology, biology, art and art history, and English (expository writing).

Doctor of Philosophy

Graduate training in anthropology at the Ph.D. level is designed to lead to professional competence in scholarly research and teaching. Students at The University of Iowa currently may select specializations in all four subfields of anthropology.

Training in a specialization is guided by a Ph.D. committee composed of members of the faculty. The student must work closely with the committee to plan a program that is consistent with the student's subfield interests.

These are the requirements:

- At least 72 semester hours of graduate course work; students specializing in sociocultural anthropology must take 113:201 Seminar: Anthropological Theory;
- Demonstration of a reading knowledge of one foreign language;
- Ethnographic or archaeological specialization in a major geographic area (for example, North America, Mesoamerica, South America, Oceania, Southeast Asia, the Caribbean, Europe, Africa, approved by the student's Ph.D. advisory committee;
- Specialization in a major and minor topical area;
- A written comprehensive examination in the student's areas of specialization; and
- Preparation and oral defense of a dissertation.

The major topical area is the area of theoretical concentration and orientation for the dissertation. Kinds of topics that may serve either as major or minor areas in sociocultural or linguistic anthropology include kinship or social organization, ethnohistory, economic anthropology, symbolic anthropology, the anthropology of art, development anthropology, language and culture, religion, cultural ecology, and urban anthropology. Examples of possible major topical areas for students in archaeology include settlement archaeology, environmental archaeology, and dating methods. Examples of major topical areas for students in physical anthropology include human evolution, primate evolution, primate anatomy, and primate behavior.

The comprehensive examination ordinarily is taken when the student's course work is completed or nearly completed, after the language requirement has been satisfied, and before the student begins field work. All doctoral candidates are required to carry out original anthropological research. Ordinarily, students conduct field work as the basis for their dissertations; occasionally, however, a research proposal may be carried out using only documents, collections, or other source materials.

All doctoral candidates are required to be adequately trained in techniques of gathering primary data in archaeological, physical, or ethnographic field research.

Field Research

Opportunities are available for students to participate in archaeological field research in central Mexico or at various sites in the Midwest. Under the direction of University archaeologists, students acquire skills in data recovery and interpretive techniques. Occasional field work in Southeast Asia is also available to graduate students in the paleoanthropology research program.

Admission

Applicants for admission to the graduate program in anthropology are considered regardless of the field of their previous training. An applicant with an M.A. degree in another discipline must seek admission as a first-year graduate student. Admission to the department's graduate program may be at either the M.A. or Ph.D. level; however, full admission to the Ph.D. program depends on successful fulfillment of all departmental requirements.

Any student with an M.A. with thesis may apply for admission to the Ph.D. program. A student admitted with an M.A. in anthropology from another institution may proceed directly to a specialized Ph.D. program.

Applicants for admission to the graduate program must meet the general admission requirements of the Graduate College (see "Graduate College" section of the *Catalog*) and are required to submit a completed University application form, transcripts of all previous undergraduate and graduate work, three letters of recommendation from individuals competent to judge the candidate's potential for graduate training, scores from the aptitude portion of the Graduate Record Examination (GRE) Aptitude Test, and at least one written example of previous work (for example, a term paper or an original experiment). Applicants with an M.A. degree from another university must submit a copy of their master's thesis; applicants who earned an M.A. without thesis or whose thesis is not yet complete should submit written copies of three papers completed in graduate school.

Applicants should have at least a 3.00 grade-point average. However, applicants with lower grade-point averages may be admitted with conditional status if other criteria indicate potential for graduate work.

Assistantships

Most graduate students receive financial aid in the form of teaching and research assistantships. Application for an award should be made directly to the Department of Anthropology chair.

Facilities

The Department of Anthropology has access to the Iowa Archaeological Collections through the Office of the State Archaeologist and maintains its own archaeological collections (Midwest prehistoric and historical). Thomas H. Charlton maintains a field laboratory in Mexico and is associated with the Teotihuacán Archaeological Research Facility. A well-equipped laboratory for the study of physical anthropology recently has been added to departmental facilities.

The University is a charter member of the Human Relations Area Files (HRAF), an extensively annotated set of source materials on the peoples of the world—their environments, behavioral patterns, social lives, and cultures. The HRAF and other library resources give anthropology students access to source materials on more than 400 different cultures. Through the Project for the Advanced Study of Art and Life in Africa (PASALA), anthropology students have access to the Stanley Collection of Art at The University of Iowa Museum of Art. Through the University's exchange program with the University of Iceland, Iowa students can receive scholarships to study Icelandic language there.

Faculty

Members of the anthropology faculty have studied and lived in the Pacific Islands, Asia, Iceland, Great Britain, Africa, the Caribbean, Mesoamerica, South America, and the Subarctic. Recent field research has been conducted in Mexico, Guatemala, Peru, Truk Islands in Micronesia, Iceland, Great Britain, Mali, Burkina Faso, Benin, Chad, Gabon, Zaire, the eastern Caribbean, China, India, Burma, Vietnam, and the Canadian Subarctic.

Research topics currently being examined by the faculty include paleoanthropological investigations of Pleistocene Karst caves in northern Vietnam; precontact state systems and the historical archaeology of the Valley of Mexico; comparative syntax and Mayan languages; Peruvian underdevelopment and consequences for women workers; patterns of political and economic development of emerging nations; agricultural and economic decision making among rural peoples in the Peruvian Amazon; women in socialist societies; alcohol and drug studies; ethnohistory, ecology, and social organization of Indian peoples of the American Subarctic; West Indian migrants in London; political economy of the eastern Caribbean; social impact of rural development projects in Africa; art, magic, and the generation of metaphors as adaptation to social change in Africa; politics, society, history, and literature of medieval Iceland; maritime anthropology and fisheries policy in the United States and Iceland; and economic anthropology in Southeast Asia and Iceland.

Courses

For Undergraduates

113:000 Cooperative Education Internship 0 s.h.

113:3 Introduction to the Study of Culture and Society 3-4 s.h.
Comparative study of culture and social organization. GER: social sciences.

113:10 Anthropology and Contemporary World Problems 3 s.h.
Selected world problems from an anthropological perspective, comparing and contrasting current dilemmas with those faced by diverse human groups in recent times and the distant past. GER: social sciences.

113:12 Introduction to Prehistory 3 s.h.
Data and theories on evolution of human cultures from end of Pleistocene to emergence of complex societies; emphasis on prehistoric cultural information from areas of the world from which relatively complete sequences are available. GER: historical perspectives.

113:13 Human Origins 3 s.h.
Processes and products of human evolution from the perspectives of heredity and genetics, evolutionary theory, human biological characteristics, the fossil record, artifactual evidence, and biocultural behaviors. GER: natural sciences.

113:14 Language and Human Behavior 3 s.h.
Human language in the context of animal communication; the development and acquisition of language; biological base; language as a linguistic system in cultural social context. GER: social sciences.

113:20 Introduction to Midwestern Prehistory 3 s.h.
Prehistoric cultural sequence of Iowa viewed against the background of North American prehistory; discussion of current and future research.

113:75 Individual Study 1-3 s.h.
Supervised reading in a special area or subdivision of anthropology in which the student has had basic course work.

113:97 Honors Research 2-4 s.h.
A special research project chosen in consultation with the honors adviser. May be repeated.

Advanced Courses

General Anthropology

113:101 General Anthropology 3 s.h.
Comparative study of culture and social organization. For nonmajors with advanced standing; not open to students who have taken 113:3.

113:102 Anthropological Data Analysis 3 s.h.
Quantitative procedures for analyzing field data and library materials; elementary statistics and introduction to computers.

113:103 Introduction to Museology 2 s.h.
History, philosophy, operations, and management of various kinds of of museums and related institutions; emphasis on American museums; field trip. Same as 24:112, 97:115, 104:112, 7S:112.

113:106 Interviewing Americans 3 s.h.
Studies of contemporary Americans through interviews, questioning and recording techniques, ethnographic writing. Same as 45:199.

113:107 Transcultural Mental Health 3 s.h.
Survey of cross-cultural perspectives on mental health and mental illness; expected behavioral patterns for different developmental ages in various cultures, and deviance from these patterns. Prerequisite: 113:3 or 113:101 or consent of instructor. Same as 96:174.

113:108 Health and Cultural Diversity 3 s.h.
Cross-cultural perspectives on dynamics of health and illness. Prerequisite: 113:3 or 113:101 or consent of instructor. Same as 96:172.

113:109 Literature and Anthropology 3 s.h.
Topics and emphases vary with instructor. Same as 8:151, 48:151.

113:146 History of Anthropology 3 s.h.
Development of anthropology as a discipline; comprehending persons, concepts, problems, and theories, stressing cultural anthropology. Consent of instructor required.

113:147 Special Topics in Anthropology 2-3 s.h.
Problems and concepts involved in comparing and contrasting behavior and ideas of different cultures; content varies according to special interests of instructor. May be repeated twice with consent of instructor.

113:148 Special Topics in Anthropology 3 s.h.
See 113:147.

113:149 Special Topics in Anthropology 2-3 s.h.
See 113:147.

113:151 Sociology of the Third World 3 s.h.
Economic development as a sociological problem: social institutions and social organization of underdeveloped areas; social and economic development programs; social change and consequences of industrialization and urbanization in underdeveloped areas. Prerequisite: 113:3 or 113:101 or 34:1. Same as 34:151.

113:157 Alcohol and Culture 3 s.h.
Cross-cultural view of use and abuse of alcoholic beverages; focus on common patterns of drinking and social variability in drunken comportment; implications of study of drinking in other cultures; drinking behaviors in American society. Prerequisite: 113:3 or 113:101 or consent of instructor.

113:159 Anthropology of African Art 3 s.h.
What art is and what it does for the people creating it; the nature of symbols and representation; changing social and historical contexts; how object-oriented anthropology advances learning; African national museums; research on objects in the University's permanent collection. Same as 129:159, 141:159.

113:181 Race, Ethnicity, and International Relations 3 s.h.
Racial and ethnic conflict, particularly in situations that threaten regional and world balances; efforts to alleviate these situations. Same as 129:151.

113:183 Independent Study arr.
Consent of instructor required.

113:202 Ethnographic Field Methods 3 s.h.
Basic data-gathering techniques for field research in sociocultural anthropology.

113:275 Development Policy and Planning in the Third World 3 s.h.
Same as 44:275, 42:275, 6E:234, 102:275, 34:275, 7F:275.

Ethnology

113:110 Indians of North America 3 s.h.
History and culture of American Indian peoples; emphasis on North America.

113:113 Africans in the New World 3 s.h.
Social and cultural history of Black populations in the New World, with emphasis on continuity and change in the context of slavery; contemporary Black societies, with emphasis on cultural unity and variation. Same as 129:113.

113:115 Ethnology of South America 3 s.h.
Indigenous American cultures in lowland and Andean South America at the time of European contact; subsequent history and contemporary cultures in South American countries; social, religious, economic, and political aspects of various peoples.

113:116 Ethnology of Mesoamerica 3 s.h.
Indigenous peoples of Mesoamerica: history, post-conquest ethnographic data; contemporary problems and prospects. GER: foreign civilization and culture.

113:118 Social Anthropology of the Caribbean 3 s.h.
Historical background and other factors underlying contemporary social and cultural situations in the insular and circum-Caribbean region; emphasis on Afro-American populations and cultural components. GER: foreign civilization and culture. Same as 129:115.

113:120 Peoples and Cultures of Africa 3 s.h.
Anthropological theory and ethnography; African ethnic groups studied in depth include the Gikuyu of Kenya, the Tabwa of Zaire, the Yoruba of Nigeria, and a Voltaic people of Burkina Faso; varying circumstances of environment, history, and political economy. Same as 129:157, 141:157.

113:124 Japanese Language and Culture 3 s.h.
Introduction to the Japanese language, with emphasis on sociolinguistics: language origins, the language in culture contact, the lexicon, speech levels, and the ethnography of speech events at a wedding. Same as 39J:124.

113:125 Japanese Society 3 s.h.
Description and analysis of Japanese culture and society; emphasis on modern Japan. GER: foreign civilization and culture. Same as 39J:125.

113:126 Chinese Society: Traditional 3 s.h.
Description and analysis of traditional Chinese culture and society; emphasis on village life in the context of a major historical tradition; material from Taiwan and prerevolutionary China. Same as 39:151.

113:127 Ethnology of Oceania 3 s.h.
Comparative ethnography of island Oceania (Polynesia, Micronesia, Melanesia); postcontact and current history of the Pacific area, special problems of living in island habitats, contributions of Oceanic ethnography to anthropological theory; examination of contemporary problems and research trends. GER: foreign civilization and culture.

113:128 Chinese Society: Socialist 3 s.h.
Description and analysis of contemporary Chinese culture and society in the People's Republic of China; emphasis on the effect of a revolutionary philosophy on the lives of villagers and the urban working class. Same as 39:152.

113:129 Ethnology of Southeast Asia 3 s.h.
Historical background and ethnology of mainland Southeast Asia, exclusive of Vietnam; ethnic identity, ecology, forms of political organization, and the relation of these to other social factors. GER: foreign civilization and culture. Same as 39:129.

113:131 Latin American Economy and Society 3 s.h.
Aspects of the development and present structure of Latin American economy and society, with emphasis on rural regions in the context of national development; general focus on area as a whole. GER: foreign civilization and culture.

113:132 Latin American Studies Seminar 3 s.h.
Offered by anthropology and other cooperating Latin American studies departments (history, political science, and Spanish and Portuguese); topics vary. Same as 38:159, 35:176.

Social Institutions

113:119 Urban Anthropology 3 s.h.
Cross-cultural approach to the study of urban situations; emphasis on urbanizing processes, migration and adaptation, aspects of class and ethnicity in urban settings, and urban economic relations. GER: social sciences.

113:135 Work and Society 3 s.h.
How work is organized in society; the social relations characteristic of different modes of production; case studies of foraging, peasant, and advanced capitalist societies. Prerequisite: junior standing or consent of instructor.

113:136 Aging: A Cross-Cultural Perspective 3 s.h.
Unique and varied forms of behaviors, human values, and social organization associated with aging and the aged in different cultures.

113:138 Economic and Political Development: Women's Roles 3 s.h.
Consequences of development for women in Latin America, Africa, and Asia; how women have responded to development; history and theory of development in rural and urban settings cross-culturally; emphasis on women in contemporary social change. Same as 34:168, 131:168.

113:141 Economic Anthropology 3 s.h.
Economic decision making; social institutions associated with production, distribution, and consumption of goods; effects of economic development programs on Third World peoples. Prerequisite: 113:3 or 113:10 or 113:101 or graduate standing or consent of instructor.

113:142 Anthropology of Religion 2-3 s.h.
Anthropological approaches to the study of religion, studies of various religious roles; shamanism, witchcraft, curing; mythology; the place of religion in social and cultural change. Same as 32:165.

113:143 Environment and Culture 3 s.h.
Individual and group responses to scarcities of natural resources such as land, water, and food. Prerequisite: 113:3 or 113:10 or 113:101 or consent of instructor.

113:145 Symbolism and Structuralism 3 s.h.
Structuralist approach in anthropology, its major proponent, C. Levi-Strauss, and its critics; other approaches and symbolism, Geertz and Douglas.

113:152 Cognitive Anthropology 3 s.h.
Processes and products of and capacities for knowledge, and the application and development of ideas about cognition in anthropological contexts; understanding cultural similarities and differences. Prerequisite: 113:3 or 113:101 or consent of instructor.

113:153 Introduction to the Study of Kinship 3 s.h.
Fundamental concepts and definitions in kinship studies; historical overview of the field, examination of contemporary approaches; focus on several major kinship theorists. Prerequisite: 113:3 or 113:101.

113:154 American Kinship 3 s.h.
Anthropological analysis of American kinship and family structure in contemporary United States; special problems in the study of kinship through the American kinship system. Prerequisite: 113:3 or 113:101 or consent of instructor.

113:155 Race and Ethnic Relations 3 s.h.
Multidisciplinary study of intergroup relations; emphasis on historical, sociological, and political issues in study of American minority groups. Prerequisite: 113:3 or 34:1. Same as 34:155, 129:114.

113:156 Women's Roles in Cross-Cultural Perspective 3 s.h.
Social, economic, and political roles of women around the world; analysis of sex roles, with emphasis on culture change and its implications for the lives of women in various societies. Same as 131:156.

113:158 Myth, Magic, and Mind 3 s.h.
How metaphors organize thought and communication; reflexive anthropology; culture as "text"; the contingency of truth; representation; ethnography as allegory; parable, paradox, and "edification by puzzlement"; the effectiveness of symbols. Open to undergraduate students with consent of instructor. Same as 129:158, 141:158.

113:201 Seminar: Anthropological Theory 3 s.h.
Contemporary theoretical issues in sociocultural anthropology.

113:210 Seminar: Gender in Chinese Society 3 s.h.
Gender ideology and behavior in China in the context of family, work, sexuality. Same as 131:210, 39:210.

113:220 Seminar: Feminist Anthropology 3 s.h.
Analysis of anthropological theory, methods, research, and epistemology from a feminist perspective. Open only to graduate students. Consent of instructor required. Same as 131:220.

113:240 Seminar: Sociocultural Anthropology 3 s.h.
Comparative analysis of social institutions in the world's societies; problems in theory, method, and interpretation. Prerequisite: 113:3 or 113:101 or graduate standing.

Archaeology

113:111 Indians of the Woodlands and Plains 3 s.h.
Prehistoric and historic Indians of the Middle West region of North America; ecological adjustments, subsistence base, and technological developments of the various groups. Prerequisite: 113:12.

113:160 Environmental Archaeology 3 s.h.
Application of methods and theories from ecology, cultural ecology, paleoecology, cultural evolution, general systems theory, and economics to prehistoric archaeological data; emphasis on the relationships among past cultures and their local and regional environments. Prerequisite: 113:12.

113:162 Laboratory Methods in Archaeology arr.
Study of archaeological materials recovered by excavation and survey training in all aspects of laboratory research. Consent of instructor required.

113:163 Archaeology of Mesoamerica 3 s.h.
Archaeological data related to the evolution of civilization in Mesoamerica; sequence from hunter-gatherers to A.D. 1519; emphasis on Central Mexico and Maya area. Prerequisite: 113:12.

113:164 Comparative Prehistory 3 s.h.
Cultural evolution in the Old World and the New World; emphasis on developments from pre-agricultural societies to the appearance of urban civilizations; areas of primary concern are Mesoamerica, the Central Andes, the Near East, Egypt, the Indus Valley, and China. Prerequisite: 113:12.

113:165 History of Archaeology 3 s.h.

113:167 North American Archaeology 3 s.h.
Prehistoric cultural development north of Mexico from initial occupation to European contact and conquest; emphasis on understanding the dynamics of culture change.

113:168 Method and Theory in Archaeology 3 s.h.
Survey of current theoretical approaches to archaeology and methods utilized to investigate the past, including site formation processes, taphonomy, sampling and research design, typology and seriation, subsistence-settlement reconstruction, and cultural evolution. Prerequisite: 113:12.

113:169 Post-Processual Archaeology 3 s.h.
Recent advances in archaeological theory that emphasize symbolic and structural archaeology; interpretive archaeology (post-modernist); Marxist archaeology; feminist archaeology; ethical concerns about how archaeology creates the past. Open to graduate students in anthropology or to others with consent of instructor.

113:179 Prehistoric Voyages to the New World 3 s.h.
The question of prehistoric Euro-Asiatic contacts with Native American cultures; major oceanic sailing routes, contacts with maritime civilizations such as Medieval Norse, Irish, Mediterranean classical, Chinese, Japanese, and Polynesian; diffusionist hypotheses and the social impact of such prehistoric contacts on Native Americans.

113:197 Special Topics in Archaeology arr.

113:199 Field Research in Archaeology arr.

113:268 Seminar: Archaeological Theory and Method 3 s.h.
Development and current status of theory and method in Americanist archaeology.

Physical Anthropology

113:186 Seminar: Human Osteology 2 s.h.
Normal and pathologic human osteology as applied to demographic and epidemiological analyses in archaeological investigations. Consent of instructor required.

113:187 Human Evolution 3 s.h.
Detailed survey of human evolution from the earliest fossil record of apes to the origin and diversification of the hominid family and the appearance of modern *Homo sapiens*; evidence drawn from paleontology, comparative anatomy, biomolecular studies, and archaeology considered in an evolutionary perspective. Prerequisite: 113:13 or 37:131 or 12:121 or consent of instructor.

113:188 Primate Behavior, Ecology, and Evolution 3 s.h.
Examination of fossil evidence for the origin and diversification of the primate order; survey of morphology, systematics, behavior, and ecology of living species. Prerequisite: 113:13 or 37:108 or 37:131 or 12:121 or consent of instructor.

113:190 Feminist Perspectives on Biology and Culture 3 s.h.
Examination and critique of physical anthropology and prehistoric archaeology from a feminist perspective; emphasis on investigation of gender and the rising importance of women investigators; topics include human evolution, the rise of the state, division of labor and social stratification in prehistory. Prerequisites: 113:12, 113:13, and consent of instructor. Same as 131:190.

113:285 Seminar: Biological Anthropology 3 s.h.
Detailed review of physical anthropology including heredity and genetics, evolutionary theory, human

biological characteristics, the primate and human fossil record, primate behavior and ecology, and human adaptations. Open to graduate students in anthropology, biology, or related department or to others with consent of instructor.

Linguistics

113:171 Anthropological Linguistics **3 s.h.**
Structures of spoken languages, emphasizing techniques for analyzing linguistic data; history, phonetics, phonology, morphology, syntax. Same as 103:171.

113:172 Language and Culture **3 s.h.**
Language in relation to organization, variation, and change in culture and society; its origins and role in human evolution. Prerequisites: introductory course in general social/cultural anthropology and an introductory course in linguistics, or consent of instructor. Same as 103:170.

113:173 Language and Gender **3 s.h.**
Gender-related language variation; current research on gender-specific linguistic forms and usage in both the United States and other language communities; introduction to relevant principles of linguistic theory and analysis. Same as 103:150, 131:147.

113:271 Seminar: Anthropological Linguistics **arr.**
Same as 103:220.

Individual Reading and Research Projects

113:383 Independent Study: Anthropology **arr.**

113:384 Research: Anthropology **arr.**

113:385 Thesis **arr.**

APPLIED MATHEMATICAL SCIENCES

See "Division of Mathematical Sciences."

ART AND ART HISTORY

Director: Wallace J. Tomasini
Professors: Keith Achepohl, Wayne Begley, Hans Breder, Chunghi Choo, Richard DePuma, John Dilg, Stephen Foster, Peter Feldstein, Stephen Foster, Charles Hindes, Hung-shu Hu, Bunny McBride, Ben Moss, Virginia Myers, Joseph Patrick, Howard Rogovin, Julius Schmidt, Stephen Schultz, Wallace J. Tomasini, George Walker, Marilyn Zurmuehlen
Professors emeriti: Margaret A. Alexander, Robert L. Alexander, Byron Burford, Charles D. Cuttler, S. Carl Fracassini, Mauricio Lasansky, James Lechay, John H. Schulze
Associate professors: Robert Glasgow, Sue Hettmansperger, Robert Rorex, Christopher Roy, John Scott, James Snitzer, Norval Tucker
Assistant professors: Deborah Boardman, David Dunlap, Ab Gratama, Dorothy Johnson, Ann Roberts, Erin Stack, Margaret Stratton
Undergraduate degrees offered: B.A., B.F.A. in Art
Graduate degrees offered: M.A., M.F.A. in Art; M.A., Ph.D. in Art History

The University of Iowa School of Art and Art History pioneered the artist-teacher concept, appointing its teachers on the basis of the quality of their work rather than the number of their degrees. It was one of the first university-based art schools to bring established professional artists to its permanent faculty.

It was also among the first art schools to join studio art with art history studies, reflecting the concept that the young artist benefits from a formal study of the traditions of art, and a prospective historian from personal experience with the creative process.

Emphasis on the creative productivity of its faculty reflected an educational philosophy that made Iowa one of the first universities to accept creative work for academic credit.

Early on, the school established a tradition of, and achieved national recognition for, presenting large exhibitions of contemporary American painting and sculpture.

Its national image and position are maintained not only through The University of Iowa Museum of Art, whose exhibitions and growing collection of art works represent all periods and nations, but also through its continuing program of employing visiting artists and scholars of national and international prominence.

The fluidity of its undergraduate and graduate programs in art history continues with the support of an excellent art library and a large collection of visual materials. Its short-term workshops conducted by visiting lecturers and the permanent faculty continue to keep students directly involved with current scholarship.

Iowa's art and art history graduates enjoy success as practicing professional artists, art historians, art department administrators, museum directors and curators, theater designers, and teachers. Regardless of employment depressions, graduates of the school traditionally have continued to find acceptable positions. Although it has always placed an emphasis on the fine arts (specifically commercial art courses are not part of its program), the school offers courses in the theory of graphic design to prepare graduates for positions as commercial designers.

As much as possible, the design of academic programs is arranged to meet the individual student's needs, permitting the development of specific as well as general programs in studio arts and history. The major requirements of the undergraduate program are broad and flexible; specialization is discouraged. The art history major requires at least an introduction to studio work. The studio major requires development of a foundation in art history and in at least six areas of studio art. The aim of the joint curriculum is to give students a basic understanding of art and aesthetics; it does not focus on particular short-term styles or fashions.

Undergraduate Programs

Bachelor of Arts

The B.A. candidate in art or art history must earn at least 74 semester hours of credit in non-art courses but may apply no more than 86 non-art semester hours toward the total of 124 semester hours required for the degree.

Cross-listed courses originating in the School of Art and Art History may not be counted toward non-art electives.

Studio Emphasis

The B.A. degree with studio emphasis requires the following courses and credits in art:

Art History:	
Two courses selected from 1H:1, 1H:5, 1H:6 and 1H:16	6 s.h.
and	
Two additional courses exclusive of those courses listed above	6 s.h.
1A:1-2 Colloquium	2 s.h.
1A:3 Basic Drawing	2 s.h.
1A:4 Basic Design	2 s.h.

Any two of the following courses:

1C:60 Ceramics I	2 s.h.
1G:84 Introduction to Metalworking and Jewelry	2 s.h.
1J:90 Multimedia I	2 s.h.
1N:15 Undergraduate Sculpture I	2 s.h.

Two beginning courses, one each from two different studio areas not taken to satisfy the requirements above. 4 s.h.
Beginning courses in areas not listed above are:

Design	
1D:21 Problems in Design I—Form and Structure	2 s.h.
1D:22 Problems in Design II—Form and Function	2 s.h.
1D:25 Lettering I	2 s.h.
1D:28 Graphic Design I	2 s.h.
Drawing	
1F:7 Life Drawing I	2 s.h.
Painting	
1K:9 Painting I	2 s.h.
Photography	
1L:34 Beginning Photography	2 s.h.
Printmaking	
1M:51 Undergraduate Printmaking I	2 s.h.
Fiber Art	
1P:191 Printing and Dyeing	1-3 s.h.
1P:192 Weaving	1-3 s.h.

Electives, selected only from courses that originate in the School of Art and Art History, must bring the total number of credits in history of art, studio, or art education combined to a minimum of 38 semester hours and may raise the total to a maximum of 50 semester hours. No more than 50 semester hours of credit in the combined art history, studio, or art education courses may be counted toward the total of 124 semester hours required for the degree.

Transfer students majoring in studio must complete at The University of Iowa a minimum of 3 semester hours in art history and 12 semester hours in studio, in addition to the six basic studio courses required

above and including at least two different studio areas.

Undergraduate transfer students majoring in studio must, at their first registration, show a portfolio to a faculty review committee that will determine the student's placement in, or exemption from, the sequence of basic studio courses.

Art History Emphasis

Major requirements for the B.A. degree with an emphasis in art history are 9-12 semester hours of studio courses, as advised, and 6 semester hours (two courses) from among 1H:1, 1H:5, 1H:6, and 1H:16, plus 18 semester hours of intermediate and advanced art history.

Electives, selected only from courses that originate in the School of Art and Art History, must bring the total number of credits in history of art, studio, or art education combined to a minimum of 38 semester hours and may raise the total to a maximum of 50 semester hours. No more than 50 semester hours of credit in the combined art history, studio, or art education courses may be counted toward the total of 124 semester hours required for the degree.

Non-art credits must include at least 12 semester hours in at least three disciplines, including two of the following: anthropology, classics, drama, history, language, literature, music, philosophy, religion, or sociology.

Transfer students planning to major in art history should meet with the professor in charge of art history to discuss the student's required minimum registration for courses in art history and studio.

Art Education

Students seeking the B.A. degree in art education may choose either the studio or art history emphasis. Electives used to bring the total combined credits in history of art, studio, or art education to the required minimum of 38 semester hours or the maximum 50 semester hours must be selected from courses that originate in the School of Art and Art History. In addition to the general requirements for teacher certification (see the "College of Education" section of the *Catalog*), students must satisfy these specific requirements:

1E:196 Concepts in Art Education	3 s.h.
1E:198 Art Education Studio	3 s.h.
7E:143 Methods: Art	3 s.h.
7S:105 Advanced Methods: Art	3 s.h.
7S:187 Seminar: Curriculum and Student Teaching	3 s.h.
7E:192 Special Area Student Teaching	6 s.h.
7S:191 Observation and Laboratory Practice in the Secondary School	6 s.h.

The following course is an elective:

1E:230 Art Education and the Museum	3 s.h.

Bachelor of Fine Arts in Studio

Prospective B.F.A. students must apply to enter the program after completing at least one semester of work in the studio area of concentration, but before completing 50 semester hours in art. B.F.A. candidate reviews are held once each semester.

Students who wish to enter the B.F.A. program should consult the faculty in the studio area of concentration for information about the required portfolio review.

The B.F.A. requires that the 124 semester hours needed to graduate must include 62 semester hours of credit from courses taken outside the School of Art and Art History and 62 semester hours of credit in School of Art and Art History courses. In addition to the General Education Requirements (see the "College of Liberal Arts" section of the *Catalog*) and major requirements listed above for the B.A. degree with studio emphasis, the B.F.A. candidate must complete three courses in a studio area of concentration beyond the fundamental course, and must complete at least the second semester of course work in each of two additional studio areas. Art education majors in the B.F.A. program must meet the same teacher certification requirements as those in the B.A. program. The B.F.A. candidate may waive 6 semester hours of the General Education Requirement in historical perspectives.

Honors

Art majors who are eligible to enroll in the College of Liberal Arts Honors Program may enroll in the honors program of the School of Art and Art History.

Honors students in art history must maintain a minimum grade-point average of 3.50 in art history courses and must complete 3 semester hours each in a seminar and a written thesis beyond the 18 semester hours of intermediate and advanced art history.

The undergraduate seminar requirement may be met by completion of a graduate seminar or supervised course of directed studies. The thesis requirement may be met by a research paper produced in a graduate seminar or a course of directed studies judged to be comparable in quality to graduate degree work.

Honors students in studio must maintain a minimum grade-point average of 3.50 in studio courses, hold an exhibition of their studio work, and prepare a statement of the sources of the exhibited studio work. The statement may be based on the history of art, history of ideas, philosophy, and so forth written under the supervision of faculty in the student's studio concentration area. Registration for the course of individual instruction that leads to the exhibition and related statement may be for 3 semester hours of credit.

Minors

A minor in art requires 15 semester hours of credit in art courses with a minimum grade-point average of 2.00. At least 12 of these hours must be in advanced-level art courses taken at The University of Iowa.

Advanced courses in the School of Art and Art History are those numbered 100 and above plus 1K:49, 1M:52, and 1N:17.

Graduate Programs

Master of Arts in Art History

An M.A. student in art history is expected to acquire a broad general knowledge of art history as an academic and humanistic discipline, become familiar with major periods and monuments of world art, and gain proficiency in techniques of research within selected areas.

Specific requirements include:

A B.A. or B.F.A. degree; at least 18 semester hours of undergraduate work in art history is recommended;

A minimum of 30 semester hours of graduate-level course work, with a grade-point average of 3.00 or higher; students planning to transfer graduate credits from another institution should note that the minimum residence requirement for the M.A. degree is 24 semester hours; and

A grade of A or B in at least one one-semester course at a level equivalent to University of Iowa courses numbered 100 or above, taken after receiving the B.A., in each of five of the following areas of art history:
Ancient (to 300 A.D.)
Medieval (300-1500)
Renaissance to Baroque (1500-1750)
Nineteenth century to modern
Asian
African, Oceanic, and Pre-Columbian

The following may be substituted for the above course distribution:

A comprehensive written examination (totaling approximately four hours in length) broadly covering the entire field of art history. The examination usually is given three times per year, at the beginning of each semester and the summer session. Students must take this examination at the latest within the next two regularly scheduled examination dates following the semester in which they complete 20 semester hours of graduate work. The comprehensive examination may be retaken only once.

Course distribution for the M.A. in art history is as follows:

1H:294 Seminar: Methodology of Art History and Criticism	3 s.h.
*Two other art history seminars (with different instructors)	6 s.h.
Additional art history courses	14-21 s.h.
Studio	0-6 s.h.

Courses outside the school	0-9 s.h.

*These seminars can be applied toward distribution if the student has earned a grade of B or higher in an undergraduate course in the same area.

Students are required to have a total of 6 semester hours of studio training on either the undergraduate or graduate level. Students with 6 semester hours or more of undergraduate studio training are exempt from the graduate studio requirement. Students preparing to teach in both the art history and studio areas will take 12-18 semester hours of studio course work, with a minimum of 9 semester hours in one subject in addition to the undergraduate requirement for a studio major. They also must satisfy the drawing requirement. Studio courses may be taken satisfactory/unsatisfactory.

M.A. candidates with undergraduate majors in art history are encouraged to take courses outside the school.

Within the first 20 semester hours of graduate work, the M.A. candidate is expected to demonstrate the ability to read art historical writings in an appropriate foreign language, normally German or French, though other languages, including Oriental languages, may be acceptable. This requirement may be fulfilled by satisfactory completion of the final semester of a Ph.D. language reading course, or satisfactory completion (at least a 3.00 grade-point average) of the fourth semester of a college or university language course.

The student must prepare either a written thesis, for which 3 semester hours of credit may be allowed, or a substantial research paper (approximately 20-40 pages).

Specialized Area Studies Program

The school also offers a specialized area studies program on the M.A. level. Formal approval to enter this program is based on the student's background, intentions, and seriousness of purpose, and it requires satisfactory demonstration of the potential for outstanding work to the faculty in the area of the student's specialization. To encourage in-depth work, the student is expected to concentrate course work in his/her major area of focus. Acceptance into the area studies program does not change the student's obligations to the methodology, language, seminar and research paper/thesis requirement. In consultation with the faculty adviser, the student takes appropriate courses in related areas offered by other departments. Faculty supervising work in the specific areas evaluate the student annually. The M.A. program concludes written exams in the major and related minor areas of specialization, an oral exam, and the submission of a significant research paper or thesis.

Master of Arts in Studio

The school offers the M.A. degree in studio with a major in ceramics, design, drawing, metalworking and jewelry, multimedia and video art, painting, photography, printmaking, or sculpture. The degree requires:

The B.A. or B.F.A. in art equivalent to that offered at The University of Iowa (undergraduate deficiencies, if any, may be made up concurrently with, but are in addition to, graduate requirements);

A minimum of 38 semester hours of graduate work, including at least 12 semester hours in a major studio subject, with a total of at least 21 semester hours in studio courses; 9 semester hours in the history and theory of art, excluding readings and directed studies; and up to 8 semester hours of courses outside art and art history;

Clearance for M.A. candidacy by faculty review; and

Studio and written theses.

Studio majors may elect to take art history courses on a satisfactory-unsatisfactory basis.

Graduate students who have not had drawing at The University of Iowa must take at least one drawing course during the first year.

A student preparing to teach in both the studio and art history areas may complete an art history minor of 15 semester hours, including 1H:294 Seminar: Methodology of Art History and Criticism and one other seminar. These hours are in addition to the University's undergraduate requirement for an art history major and, in combination with the undergraduate hours, must satisfy the distribution requirement for art history.

Master of Arts in Art Education

Requirements for the M.A. in art education are:

The B.A. or B.F.A. in art equivalent to that offered at The University of Iowa;

Teaching certification in art;

Completion of 38 semester hours of graduate credit, including 18 semester hours of studio and art history in a ratio of two to one (either 12 semester hours of graduate credit in studio and 6 in art history, or 6 in studio and 12 in art history), 8 semester hours in graduate seminars in art education, and 12 semester hours to be specified after the student commences the program;

An oral and/or written examination in art education;

A written thesis based on research in art education or art history or a studio thesis (a studio thesis must be accompanied by a brief statement of the student's technical, aesthetic, and/or psychological approach) and, as in the M.A. degree in studio, clearance for M.A. candidacy by faculty review.

Art education majors who elect to do a studio thesis and who have not had drawing at The University of Iowa are required to take at least one drawing course, selected from the school's regularly scheduled drawing courses, during the first year in residence.

Art education majors may elect to take art history courses on a satisfactory-unsatisfactory basis.

Master of Fine Arts in Studio

The school offers the M.F.A. degree with a major in ceramics, design, drawing, metalworking and jewelry, multimedia and video art, painting, photography, printmaking, or sculpture. The M.F.A. candidate must have an M.A. degree in art equivalent to that offered at The University of Iowa; a minimum of 60 semester hours of graduate work, including at least 12 semester hours in a major studio subject, at least 6 semester hours in a minor studio field selected from the fields listed above, 9 semester hours in art history and theory of art, and 8 semester hours in courses originating outside the school; clearance for M.F.A. candidacy by faculty reviews; and studio and written theses. Thesis credits earned in an M.A. program are not applicable toward the M.F.A. credit requirement.

Doctor of Philosophy in Art History

The Ph.D. student is expected to have a broad general knowledge of art history and to acquire detailed knowledge of monuments, an understanding of artistic development, and a knowledge of research methods within certain specialized areas of world art to be selected by the student in conjunction with appropriate faculty members in the school.

The Ph.D. degree in art history is intended only for students who can effectively demonstrate scholarly potential in the field. Students may apply for a rapid track to the Ph.D., bypassing the M.A. (see "Direct Entry into Ph.D. Program," below). Specific requirements for the Ph.D. degree include the following.

All students must make formal application for admission to the art history faculty; a grade-point average of at least 3.25 is required for admission and continuance in the program.

All students, including those with an M.A. in art history from another university, must submit an art history research paper that meets the approval of at least three-fourths of the graduate art history faculty.

Students must complete a minimum of 72 semester hours of graduate level course work; toward this total, a maximum of 38 semester hours of work taken for the M.A. degree may be applied.

Students must demonstrate, within the

first 21 semester hours of graduate work beyond the M.A., ability to read art history writings in two appropriate foreign languages. The procedure for satisfying the Ph.D. language requirement is as explained in the description of the M.A. in art history program.

Students with the M.A. degree in a discipline other than art history must meet, at the graduate level, the distribution requirement for the M.A. or complete the UI M.A. comprehensive examination; submit a research paper in the field of art history to be approved by three-fourths of the graduate art history faculty; complete two seminars in two different areas; and meet the requirement for two foreign languages.

The University of Iowa residence requirement for the doctorate must be met by enrollment at this University as a full-time student in each of two semesters beyond the first 24 semester hours of graduate work.

Course requirements beyond the M.A. program outlined above are:

Two art history seminars (with two different instructors)	6 s.h.
Additional art history courses	18-30 s.h.
Courses outside the school	0-12 s.h.

Students must successfully complete a comprehensive examination in one major field (six hours) and one related field (three hours), selected by the student in consultation with the adviser and approved by the art history faculty. The minor field may be in a discipline or disciplines outside the school—for example, religion, history, literature, or philosophy.

The student must prepare a written dissertation constituting an original scholarly contribution to the field. The school will allow up to 6 semester hours of credit toward the art history course requirements for dissertation preparation. The topic of the dissertation must be presented to the faculty for approval. The student is given a final oral examination on the dissertation.

Direct Entry into Ph.D. Program

A graduate student may, at any time, apply directly to enter the Ph.D. program without first acquiring an M.A. degree; students who want to exercise this option must submit a significant research paper that meets the approval of three-fourths of the graduate art history faculty. Students may apply for this option only twice; if the second application fails, they must complete the M.A. before again applying for admission into the Ph.D. program. All other requirements, including M.A. distribution, seminars, and foreign language, remain the same.

Doctor of Philosophy in Art Education

The Doctor of Philosophy in art education gives college teachers and researchers in art education and art supervisors in state departments of education and school systems an opportunity to continue their inquiry and creative work in art history and in studio art.

The program is administered by the College of Education in cooperation with the School of Art and Art History. Students must apply for admission to the College of Education.

Admission

Students must meet the general requirements for doctoral students in the Graduate College and have an M.A. degree in art education at The University of Iowa or an equivalent degree from an accredited college or university. Students who have course work deficiencies must register for pertinent courses. Candidates must have completed one year of successful teaching experience in an elementary or secondary school to be eligible for the doctoral degree.

Application to the program must be accompanied by a representative portfolio of the candidate's work, consisting of 12 colored slide reproductions of art work and two examples of written work. Written work may consist of papers previously written for a course or may be new work. The portfolio should be submitted to the Office of Art Education, 13 North Hall.

Degree Requirements

Students must complete at least 60 semester hours of graduate work beyond the M.A. The curriculum must be planned with the student's adviser and must include at least 15 semester hours in the School of Art and Art History, 15 semester hours in art education graduate seminars, 15 semester hours in a related area (e.g., aesthetics, anthropology, higher education, psychology, sociology), and 15 semester hours in thesis and tool courses (7S:306 or 7E:306 Introduction to Research in Art Education).

Students must take both oral and written comprehensive examinations. The written examination consists of an in-depth research problem to be completed within 14 days, after which an oral examination on the project is held. The research problem is assigned by the examining committee and the written portion of the examination is not intended to relate directly to the student's dissertation proposal.

Students also must complete a written dissertation for at least 12 semester hours and are expected to prepare a dissertation proposal and defend it before the dissertation committee. An oral examination on the dissertation is the Ph.D. final examination.

Graduate Admission: Studio

Admission procedures for graduate studio programs include a committee review of applications and of all of the applicant's supporting material. Applicants should consult the school for deadlines and meeting dates.

Ceramics, design, drawing, metalworking or jewelry, multimedia or video art, painting, or sculpture majors must submit slides and/or photographs of their work in their major field. Printmaking majors must submit from six to twenty original prints and at least six original drawings. Photography majors must submit a selection of 20 to 25 slides or prints. Studio applicants also must submit two slides showing examples of their work in one other area, and three letters of recommendation.

Newly admitted students who do not register within two semesters of their admission must reapply. Students who attend for a limited time, then fail to register for a period of 36 months or more, must apply for readmission.

Graduate Admission: Art History and Art Education

Applicants to the graduate program in art history must submit a term paper or other example of ability to write in the field and a one-page, single-spaced statement of their purpose in pursuing graduate studies.

Applicants to the graduate program in art education must submit a term paper or other example of ability to write in the field, and a selection of slides or photographs of their creative work in two studio areas.

All applicants must submit three letters of recommendation.

Deadline for receipt of completed art history and art education applications is June 15 for the fall semester, November 15 for the spring semester, and April 15 for summer session. March 1 is the deadline for prospective art history students to apply for financial aid for the next academic year.

Newly admitted students who do not register within two semesters of their admission must reapply. Students who attend for a limited time, then fail to register for a period of 36 months or more, must apply for readmission.

Assistantships and Scholarships

Assistantships paying approximately $9,000 per academic year for 20 hours of departmental duties weekly are awarded to graduate students on a competitive basis. One-quarter-time assistantships also are available. The award of an assistantship entitles the recipient to the Iowa resident tuition rate.

Scholarships paying partial or full tuition and entailing no departmental duties require at least a 3.00 cumulative grade-point average.

These financial aids usually are awarded to students who have been in residence for at least one semester, so that faculty members

have had an opportunity to observe their performance and potential.

Facilities

School facilities include an art library containing 75,000 volumes; a visual materials library containing 250,000 slides, 80,000 photographs, and a videodisc facility; a printshop containing intaglio, lithographic, and monotype equipment and facilities for hot-stamping foil; furnaces and equipment for large-scale iron and bronze casting processes as well as facilities for welding and fabrication of steel sculpture; a well-equipped darkroom; extensive kiln facilities including provision for construction of various types of temporary and specialized kilns; a large shop for metalworking and industrial design; electroforming equipment; a papermaking mill; a typography studio; and video equipment.

Courses

Art History

Primarily for Undergraduates

1H:1 Understanding the Visual Arts 3 s.h.
Exploration of the artistic and symbolic aspects of art required for an understanding of the ways the visual arts depict the human condition. GER: humanities.

1H:2 The Art of Tribal Cultures 3 s.h.
Traditional arts of the tribal cultures of Black Africa and the Pacific, and of the Americas before the European conquest. GER: humanities.

1H:3 Art and Religious Symbolism 3 s.h.
Analysis and interpretation of artistic images produced for world religions.

1H:4 Masterpieces of World Art 3 s.h.
In-depth analysis and interpretation of selected masterpieces of architecture, painting, and sculpture. GER: humanities.

1H:5 Western Art and Culture before 1400 3 s.h.
Interrelations among art, its creators, and the culture of the prehistoric, ancient, and medieval periods. GER: foreign civilization and culture, historical perspectives.

1H:6 Western Art and Culture after 1400 3 s.h.
Interrelations among art, its great artists, and culture from the Renaissance to the present. GER: foreign civilization and culture, historical perspectives.

1H:13 Islamic Art and Civilization 3 s.h.
Historical survey. GER: foreign civiliztion and culture, historical perspectives.

1H:16 Introduction to Asian Art 3 s.h.
Art from India, China, Southeast Asia, and Japan. GER: foreign civilization and culture, historical perspectives. Same as 39:16.

1H:26 Introduction to Ancient Art 3 s.h.
Art and architecture of Mediterranean civilizations from Minoan times to the age of Constantine. Same as 14:26.

1H:40 Introduction to Medieval Art 3 s.h.
Art and architecture in Europe from 300 to 1400 A.D.

1H:47 Introduction to Renaissance Art 3 s.h.
Art and architecture in Europe from early Renaissance to 1600.

1H:53 Introduction to Baroque Art 3 s.h.
Art and architecture in Europe from 1600 to 1750.

1H:62 Introduction to Modern Art 3 s.h.
Art and architecture in Europe and the United States from the late eighteenth century to the present.

1H:66 Introduction to American Art 3 s.h.
Architecture, painting, printmaking, and sculpture from colonial times to the present.

For Undergraduates and Graduates

Courses numbered above 100 have as prerequisite an introductory course in the appropriate art history area or permission of the instructor.

1H:103 Art of the South Pacific 3 s.h.
Traditional arts of Polynesia, Micronesia, and Melanesia.

1H:105 Art of Pre-Columbian America 3 s.h.
Art and architecture of Mexico and Peru before Cortez.

1H:107 Art of West Africa 3 s.h.
Art of the Western Sudan and the Guinea Coast. Same as 129:107, 141:107.

1H:108 Art of Central Africa 3 s.h.
Art of the Equatorial Forest and the Southern Savannah. Same as 129:110, 141:108.

1H:110 Egyptian and Mesopotamian Art 3 s.h.
Sculpture, painting, architecture, and minor arts from the close of the Stone Age to Classical times in Egypt and the Near East. Same as 32:104.

1H:113 Art of Islam 3 s.h.
Islamic architecture, painting, and minor arts in Spain, North Africa, Egypt, Turkey, Syria/Palestine, Iraq, Iran, Afghanistan, and India, circa 600-1800 A.D. Same as 32:168.

1H:114 Buddhist and Hindu Iconography 2-3 s.h.
Historical development of religious imagery of Buddhism and Hinduism in India, Central and Southeast Asia, China, and Japan. Same as 32:181.

1H:115 Art of India I 3 s.h.
Art and architecture of India from the earliest period to circa 1000 A.D., in relation to the historical development of Buddhism and Hinduism. Same as 32:174, 39:181.

1H:118 Painting of India 3 s.h.
Wall painting and miniature painting of India in relation to historical development of Buddhism, Hinduism, Jainism, and Islam. Same as 32:175, 39:168.

1H:119 Art of China 3 s.h.
Art and architecture of China in relation to philosophies and religions (Confucianism, Taoism, and Buddhism). Same as 39:159.

1H:120 Chinese Painting I 3 s.h.
Early Chinese painting from the fourth century B.C. through the thirteenth century A.D., stressing figural style but also considering emergence of landscape. Same as 39:120.

1H:121 Chinese Painting II 3 s.h.
Later Chinese painting, stressing landscape of the fourteenth through eighteenth centuries, but considering sources in earlier periods. Same as 39:121.

1H:122 Art of Japan 3 s.h.
Art and architecture of Japan in relation to philosophies and religions (Shintoism, Buddhism, and Zen). Same as 39J:156.

1H:123 Japanese Painting 3 s.h.
Japanese painting, tracing both Chinese influence and indigenous styles from the seventh through early nineteenth centuries. Same as 39J:123.

1H:126 Early Greek Art 3 s.h.
The art of the Cyclades, Crete, and Mycenae from 3000 B.C., and Greek art from Protogeometric times (ca. 1000 B.C.) through the Archaic period (ca. 480 B.C.). Same as 14:110.

1H:127 Classical Greek Art 3 s.h.
Art and architecture in the Greek world from the Early Classical period (ca. 480 B.C.) through the late fourth century B.C. Same as 14:111.

1H:128 Greek Vase Painting 3 s.h.
Development of Greek pottery techniques, styles, and subjects from the Protogeometric period through Hellenistic times. Same as 14:114.

1H:129 Hellenistic Art 3 s.h.
Sculpture, painting, architecture, and minor arts of the Hellenistic period (ca. 330-30 B.C.) in Greece, Italy, Asia Minor, and Egypt. Same as 14:117.

1H:130 Etruscan Art 3 s.h.
Villanovan and Etruscan art, religion, and culture from the Bronze Age until the conquest of Etruria by Rome. Same as 20:111.

1H:132 Early Roman Art 3 s.h.
Art and architecture of Italy and the provinces from the Late Republic (ca. 100 B.C.) through the reign of Hadrian (138 A.D.). Same as 20:110.

1H:140 Medieval Art 3 s.h.
Art of the early medieval period from the Dark Ages in Europe through the Ottonian period, including contemporary insular art.

1H:141 Medieval Art 3 s.h.
Art of Romanesque and Gothic periods.

1H:144 Northern Renaissance Art 3 s.h.
International style art; French and Netherlandish art to 1500.

1H:145 Northern Renaissance Art 3 s.h.
Fifteenth- and sixteenth-century German art; sixteenth-century Netherlandish art through Bruegel.

1H:147 Italian Medieval Art 3 s.h.
Painting, sculpture, and architecture in Italy from 1250 to 1400.

1H:148 Italian Renaissance Art 3 s.h.
Painting, sculpture, and architecture in Italy from 1400 to 1525.

1H:149 Italian Renaissance Art 3 s.h.
Painting, sculpture, and architecture in Italy from 1500 to 1600.

1H:153 Southern Baroque Art 3 s.h.
Painting, sculpture, and architecture in Italy and Spain from 1575 to 1700.

1H:154 Northern Baroque Art 3 s.h.
Painting, sculpture, and architecture in the Netherlands and England from 1600 to 1700.

1H:156 Eighteenth-Century Art 3 s.h.
Architecture, sculpture, and painting in the eighteenth century in western Europe.

1H:159 Early Nineteenth-Century Art 3 s.h.
Painting and sculpture in Europe from the late eighteenth century to mid-nineteenth; from Neoclassical Romanticism to Realism.

1H:160 Late Nineteenth-Century Art 3 s.h.
Painting and sculpture in Europe; Realism, Impressionism, Post-Impressionism, and Symbolism.

1H:162 Modern Architecture 3 s.h.
Architecture from 1900 to present in Europe and America.

1H:163 Modern European Painting 3 s.h.
From 1900 to World War II: Fauvism, Expressionism, Cubism, Futurism, Dada, Surrealism, and Abstract Art.

1H:164 Modern Sculpture 3 s.h.
From Rodin to Surrealism, emphasizing European developments.

1H:166 American Art I 3 s.h.
Art and architecture in America from colonial times through the early republic.

1H:167 American Art II 3 s.h.
Architecture, painting, and sculpture in the United States from 1825 to 1913.

1H:168 Modern American Art 3 s.h.
Painting and sculpture in the United States from the Armory Show to World War II.

1H:169 American Art IV 3 s.h.
Painting and sculpture in the United States since World War II.

1H:170 Contemporary Art 3 s.h.
Developments in American and European art from World War II to the present.

1H:180 History of Prints 3 s.h.
Presents the print both as an important art form and as influential carrier of styles and iconography from area to area, particularly in Europe from the Renaissance.

1H:181 History of Photography 3 s.h.
Photographic art in Europe and America from its inception in the 1820s to the present.

1H:186 Twentieth-Century Photography 3 s.h.
Photography in Europe and America from 1900 to the present; work of major photographers and artists using photographs examined in detail.

1H:190 Themes in Art History arr.

1H:194 Readings in Art History arr.

1H:195 Theory and Criticism in Modern Art 3 s.h.
The development and role of theory and criticism from 1900 to World War II.

1H:196 Theory and Criticism in Contemporary Art 3 s.h.
European and American criticism and theory from World War II to the present.

Primarily for Graduates

1H:202 Seminar: Problems in African Art 2-3 s.h.
Consent of instructor required. Prerequisites: 1H:107 and 1H:108. Same as 129:225, 141:202.

1H:216 Seminar: Problems in Oriental Art 2-3 s.h.
Same as 39:255.

1H:226 Seminar: Problems in Ancient Art 3 s.h.
Same as 14:210.

1H:244 Seminar: Problems in Northern Renaissance Art 3 s.h.

1H:247 Seminar: Problems in Italian Renaissance Art 3 s.h.

1H:253 Seminar: Problems in Baroque Art 3 s.h.

1H:259 Seminar: Problems in Nineteenth-Century Art 3 s.h.

1H:262 Seminar: Problems in Modern Art 3 s.h.

1H:266 Seminar: Problems in American Art 3 s.h.

1H:294 Seminar: Methodology of Art History and Criticism 3 s.h.
Use of library and other investigative resources; different types of problems in art history and criticism and their varying research requirements; scholarly presentation of research findings.

1H:300 Directed Studies arr.

1H:302 M.A. Written Thesis arr.

1H:304 Ph.D. Thesis arr.

Studio

Studio courses numbered through 99 are primarily for undergraduates and may not be repeated for credit except where indicated. Studio courses numbered 100 through 199 may be repeated for credit except where specified.

1A:1 Colloquium 1 s.h.
Basic and specific problems in the visual arts. Offered fall semesters.

1A:2 Colloquium 1 s.h.
Offered spring semesters. Continuation of 1A:1.

1A:3 Basic Drawing 2 s.h.
Two-dimensional visual language and media; examination of space and form; color. Prerequisite to other drawing, painting, and printmaking courses. Open only to art majors. Corequisite: 1A:1 or 1A:2.

1A:4 Basic Design 2 s.h.
Two- and three-dimensional form and materials. Prerequisite to other design and photography courses. Corequisite: 1A:1 or 1A:2.

1B:1 Elements of Art 2-3 s.h.
For those who have little or no previous studio experience; drawing and composition, complemented by selected reading. Not open to studio majors.

1B:2 Elements of Art 2-3 s.h.
Continuation of 1B:1, emphasis on color. Not open to studio majors. Prerequisite: 1B:1.

1B:101 Individual Instruction in Elements of Art arr.

1C:60 Ceramics I 2 s.h.
Basic methods of forming, firing, and glazing clay.

1C:61 Ceramics II 2-3 s.h.
Intermediate clay-forming techniques; clay and glaze formulation and preparation in kiln firing. Prerequisite: 1C:60 or equivalent.

1C:170 Ceramics III 2-3 s.h.
Individual projects as approved by the instructors. May not be repeated. Consent of instructor required. Prerequisites: 1C:60 and 1C:61 taken consecutively.

1C:171 Ceramics IV 2-3 s.h.
Advanced individual projects. Consent of instructor required. Prerequisite: 1C:170.

1C:172 Ceramic Materials and Effects 1-2 s.h.
Develops and utilizes empirical and practical methods of glaze and body formulation; effects of various types of kilns and firing atmospheres on glaze materials and clay bodies. Consent of instructor required. Prerequisite: 1C:170 or equivalent.

1C:174 Kiln Construction 1-2 s.h.
Theory and construction of kilns. Consent of instructor required. Prerequisite: 1C:170 or equivalent.

1C:175 Ceramics Workshop arr.
Open only to graduate students. Consent of instructor required. Prerequisite: 1C:171 or equivalent.

1C:270 Individual Instruction in Ceramics arr.
Consent of instructor required.

1D:21 Problems in Design I—Form and Structure 2 s.h.
Materials and their formal and structural possibilities. Prerequisite: 1A:4.

1D:22 Problems in Design II—Form and Function 2 s.h.
Preliminary studies of products and how they are designed; modeling skills and graphic communication skills necessary to basic project development. Prerequisite: 1A:4.

1D:25 Lettering I 2 s.h.
Introduction to typography; letterform design and history, rendering type, type identification, designing letterforms in logotypes, ordering type from a typesetter, copyfitting, designing with text type. Prerequisite: 1A:4.

1D:28 Graphic Design I 2 s.h.
Projects using basic principles of design and visual perception; preparation of mechanicals for printer; portfolio presentation methods; field trip. Prerequisite: 1A:4.

1D:110 Perspective and Shadow 2-3 s.h.
Theories of perspective and application of their basic principles to one-, two-, or three-point perspective scale drawings based on analytical specifications; principles of light, shadow; reflecting images. Consent of instructor required. Prerequisite: 1A:4 or equivalent.

1D:124 Color Theory 3 s.h.
Color theory and its applications; studio projects, readings, lectures. Completion of 1D:28 recommended. Prerequisite: 1A:4.

1D:130 Design Seminar 1 s.h.
Clarifying studio problems; guest speakers from other areas invited to participate in open-forum discussions with students. Open only to students with advanced standing. Consent of instructor required.

1D:133 Graphic Design II 3 s.h.
Designing with grids and systems; production of multipage mock-ups. Consent of instructor required. Prerequisites: 1D:25 and 1D:28.

1D:135 Graphic Design Workshop arr.
Advanced problems in visual communication. Consent of instructor required. Prerequisites: 1D:25, 1D:28, and 1D:133.

1D:137 Environmental Design I 3 s.h.
Essential technology, including drafting and rendering, employed in architectural and industrial design and related especially to environmental factors, human and geographical. May not be repeated. Consent of instructor required. Prerequisites: 1D:21 and 1D:22, or equivalent. Same as 49:138.

1D:138 Environmental Design II 3 s.h.
Design in relation to human factors: psychological and physiological, to physical environment, and to architectural and machine resources man has developed. Consent of instructor required. Prerequisite: 1D:137.

1D:141 Interior Design I 3 s.h.
Relationship of interior design to its architecture, its environment, and to the human element; use of color, materials, furnishings, and lighting in selected projects. May not be repeated. Consent of instructor required. Prerequisites: 1D:21 and 1D:22.

1D:142 Interior Design II 3 s.h.
Continuation of 1D:141, including display design. Consent of instructor required. Prerequisite: 1D:141.

1D:145 Industrial Design I 3 s.h.
Design considerations related to human factors, methods of manufacture, and marketing. May not be repeated. Consent of instructor required. Prerequisites: 1D:21 and 1D:22.

1D:146 Industrial Design II 3 s.h.
Design and development of products for mass consumption; special attention to new developments in technology and how they relate to human needs. Consent of instructor required. Prerequisite: 1D:145.

1D:149 Advanced Problems in Design 3 s.h.
Individual projects for advanced students. Open only to graduate students. Consent of instructor required.

1D:240 Individual Instruction in Design arr.

1F:7 Life Drawing I 2 s.h.
Drawing from human figure in varied media. Prerequisite: 1A:3.

1F:103 The Media of Drawing 2-3 s.h.
Varied drawing media; development of a personal drawing idiom. Consent of instructor required. Prerequisite: 1F:7 or equivalent.

1F:105 Life Drawing II 3 s.h.
Drawing from figure model in varied media. Consent of instructor required. Prerequisite: 1F:7 or equivalent. Same as 49:139.

1F:106 Undergraduate Seminar in Drawing and Painting 3 s.h.
Contemporary issues, practical and professional skills, interdisciplinary concerns, and education and career goals; visits to museums and artists' studios. Open only to senior majors in drawing and painting.

1F:108 Drawing Workshop I 3 s.h.
Compositional drawing for advanced students; varied media. Consent of instructor required. Prerequisite: 6 semester hours of 1F:105 or equivalent.

1F:109 Life Drawing III 4 s.h.
Drawing from figure model in varied media; extension of experiences in 1F:105 for students who want longer contact hours with the model and setup. Consent of instructor required. Prerequisite: 1F:105.

1F:205 Individual Instruction in Drawing arr.

1G:84 Introduction to Metalworking and Jewelry 2 s.h.
Basic metalworking techniques as applied to jewelry, holloware, and small sculptural forms.

1G:185 Advanced Metalworking and Jewelry 3 s.h.
Consent of instructor required. Prerequisite: 1G:84 or equivalent.

1G:186 Metalworking and Jewelry Workshop arr.
Emphasis on individual work. Open to majors and other advanced students. Consent of instructor required. Prerequisite: 1G:185.

1J:90 Multimedia I 2-3 s.h.
An extension of the traditional role of the individual artist into interdisciplinary areas and new materials, with emphasis on conceptual, environmental, video, and performance art.

1J:100 Multimedia II 2-3 s.h.
Continuation of 1J:90. Consent of instructor required. Prerequisite: 1J:90.

1J:101 Multimedia III 3 s.h.
Continuation of 1J:100; emphasis on individual instruction. Consent of instructor required.

1J:105 Video Art 2-3 s.h.
Studio experimentation and individual projects in black-and-white and color video. Consent of instructor required. Prerequisite: art majors must have 1J:90 or equivalent.

1J:110 Multimedia Workshop 2-3 s.h.
Emphasis on individual and group projects; collective critiques; interaction with visiting artists and scholars.

1K:9 Painting I 2 s.h.
The first of two introductory courses in painting with emphasis on observational painting as a basis for covering the practical painting fundamentals. Pre- or corequisite: 1F:7.

1K:10 Painting II 3 s.h.
Materials and techniques leading toward the development of a personal painting language; second of two introductory courses. Prerequisite: 1K:9.

1K:46 Intermediate Painting 3 s.h.
Continued exploration within a structured studio environment. May be repeated. Prerequisites: 1K:9 and 1K:10, or equivalent.

1K:49 Advanced Painting 2-3 s.h.
Individual projects in any painting medium or combination of media. May be repeated. Prerequisite: 1K:46 or equivalent.

1K:111 Watercolor Painting 3 s.h.
Prerequisites: 1K:9 and 1K:10, or equivalent.

1K:115 Graduate Painting 3 s.h.
Oil, gouache, watercolor, tempera, acrylic, and other media. Consent of instructor required. Prerequisite: 1K:47 or equivalent.

1K:116 Figure Painting 3 s.h.
Working with a model; for advanced students. Consent of instructor required. Prerequisite: 1K:47 or equivalent.

1K:118 Graduate Workshop in Painting and Drawing 1 s.h.
Addresses questions concerning media, materials, and technical problems of contemporary artists in drawing and painting. Open only to students with advanced standing. Consent of instructor required.

1K:215 Individual Instruction in Painting arr.

1L:34 Beginning Photography 2 s.h.
Use of camera, light meter, and darkroom; theory of photography; photographic history. Students provide own cameras.

1L:101 Intermediate Photography 3 s.h.
Emphasis on exploring photographic materials in the development of a personal vision. Prerequisite: 1L:34 or equivalent.

1L:105 Advanced Photography 3 s.h.
Students explore individual projects of their choice in a class situation. Prerequisite: 1L:101 or equivalent, or consent of instructor.

1L:125 Color Photography 3 s.h.
Basic color printing; the making of color transparencies; procedures of color photography. Consent of instructor required. Prerequisite: 1L:101.

1L:129 Materials and Techniques 3 s.h.
One of the following topics: zone system; studio photography; view camera; photo/graphic and nonsilver processes. Consent of instructor required. Prerequisite: 1L:101.

1L:134 Silkscreen 3 s.h.
Photographic and nonphotographic stencil techniques for silkscreen printing. Consent of instructor required. Prerequisites: 1A:3 or 1A:4, or equivalent. Same as 108:134.

1L:135 Offset Productions Workshop 3 s.h.
Emphasis on graphic arts techniques to produce postcards, broadsides, and visual books on a commercial offset press. Consent of instructor required. Same as 108:135.

1L:136 Photography Workshop arr.
Individual projects; group critiques; selected readings and discussion. Consent of instructor required.

1L:231 Individual Instruction in Photography arr.
Consent of instructor required.

1M:31 Undergraduate Lithography 2 s.h.
Fundamental techniques and characteristics of lithography. Consent of instructor required. Prerequisite: 1M:52 or equivalent.

1M:51 Undergraduate Printmaking I 2 s.h.
Elements of printmaking in various media, using metal plate, etching, engraving, dry point, Renaissance techniques; pictorial composition. Consent of instructor required. Prerequisite: 1F:7.

1M:52 Undergraduate Printmaking II 3 s.h.
Advanced work in etching, engraving, color prints; Renaissance techniques; advanced study of pictorial composition. May be repeated. Consent of instructor required. Prerequisite: 1M:51 or equivalent.

1M:121 Prints and Composition I 3 s.h.
Introduction to the print workshop.

1M:122 Prints and Composition II 3 s.h.
Engraving, etching, drypoint, woodcuts, color prints in all media; experimental studies in intaglio techniques; fine printing; Renaissance techniques; study of advanced pictorial composition. Consent of instructor required. Prerequisite: 1M:52 or equivalent.

1M:131 Lithography 3 s.h.
Fundamental technical and aesthetic characteristics of lithography; basic drawing, processing, and printing of stone and plate images; introduction to color printing. Consent of instructor required. Prerequisite: 1M:52 or equivalent.

1M:132 Advanced Lithography 3 s.h.
Advanced technical and aesthetic aspects of lithography; emphasis on color printing and advanced image-forming processes. May be repeated. Consent of instructor required. Prerequisite: 1M:131 or equivalent.

1M:141 Monotype 3 s.h.
Historical, technical, and aesthetic aspects of unique printed images. May be repeated. Consent of instructor required. Prerequisite: 1F:7 or equivalent.

1M:160 Special Workshop in Printmaking 2-3 s.h.
May be repeated. Consent of instructor required.

1M:222 Individual Instruction in Printmaking arr.

1N:15 Undergraduate Sculpture I 2 s.h.
Investigation of a variety of materials and techniques.

1N:16 Undergraduate Sculpture II 3 s.h.
Continuation of 1N:15, emphasizing a broader and more experimental attitude. Prerequisite: 1N:15.

1N:17 Undergraduate Sculpture Workshop 3 s.h.
For intermediate and advanced sculpture students with emphasis on individual work. Prerequisite: 1N:16 or consent of instructor.

1N:18 Undergraduate Sculpture in Cast Metal 2-3 s.h.
Metal casting, mold making, metal melting procedures, finishing, coloring, furnace construction, and alloying iron, bronze, aluminum, and zinc. May be repeated.

1N:150 Figure Modeling 3 s.h.
From basic to advanced experience working from the model in clay, wax, and other modeling media; anatomy, drawing, and armature building. May be repeated. Consent of instructor required.

1N:161 Graduate Sculpture I 3 s.h.
Special projects in all sculpture media. Open to graduate nonsculpture majors and advanced undergraduates. Consent of instructor required. Prerequisite: 1N:16.

1N:164 Graduate Sculpture Workshop 2-3 s.h.
Advanced problems in sculpture; includes group activities and research projects. Consent of instructor required. Prerequisite: 1N:161.

1N:165 Graduate Sculpture in Cast Metal 2-3 s.h.
Cast metal sculpture in iron, and bronze and other nonferrous alloys; furnace design, construction, and operation; alloying and metal-finishing methods; lost-wax investment; ceramic-shell, self-set sand; melt-out experimental techniques. Open to undergraduates and nonsculpture majors. Consent of instructor required. Prerequisite: 1N:16.

1N:166 Iron Foundry Workshop 2-3 s.h.
Offered summer sessions.

1N:170 Graduate Sculpture in Ceramic Materials 3 s.h.
Sculpture problems in refractory materials, using experimental and innovative techniques. Prerequisites: 1N:15 or equivalent or consent of instructor.

1N:260 Individual Instruction in Sculpture arr.

1P:000 Cooperative Education Internship 0 s.h.

1P:134 Scene Design I 3 s.h.
Concepts and procedures for design of theatrical scenery. Same as 49:134.

1P:191 Printing and Dyeing 1-3 s.h.
Printing and dyeing fabric problems; design complements techniques; photographic and other silkscreen methods; tie dye, batik, use of dyes such as fiberactive, indigo. May be repeated. Prerequisites: two basic studio courses. Same as 17:160, 49:153.

1P:192 Weaving 1-3 s.h.
Design and execution of handwoven fabrics through experimentation with colors, fibers, and basic weaves. Consent of instructor required. Same as 17:162.

1P:193 Forms and Fibers 1-4 s.h.
Two- and three-dimensional fabric complexes that deal with expression, object, and illusion; techniques include nonloom, felt making, paper, and soft sculpture. May be repeated. Prerequisite: one 100-level studio course or consent of instructor. Same as 17:164.

1P:204 Studio in Theatrical Design 3 s.h.
Consent of instructor required. Same as 49:240.

1P:290 Individual Instruction in Textile Design arr.
Consent of instructor required.

1X:110 Introduction to Papermaking 2-3 s.h.
History and fundamental techniques of Western and Eastern hand papermaking; lectures; studio projects in traditional sheet forming, paper chemistry, and creative techniques. Consent of instructor required. Same as 108:110.

1X:120 Advanced Papermaking 3 s.h.
Traditional Eastern and Western sheet forming techniques; emphasis on fiber selection and preparation, paper testing, watermarking, and sizing. May be repeated. Consent of instructor required. Prerequisite: 1X:110. Same as 108:120.

1X:130 Paperworks 3 s.h.
Techniques and approaches using pulp/paper as an art medium; emphasis on fiber selection, preparation, coloring, and 2-D/3-D techniques for image or object formation. May be repeated. Consent of instructor required. Prerequisite: 1X:110.

1X:210 Individual Instruction in Papermaking/Paperworks arr.
May be repeated. Consent of instructor required. Prerequisite: 1X:120 or 1X:130.

1Y:140 Calligraphy I 3 s.h.
Western-style letterforms as produced with the broad-edge pen or brush; organization of page format. Same as 108:140.

1Y:141 Calligraphy II 3 s.h.
Adaptation of selected historical Western-style letterforms to contemporary format; brush and broad-edge pen. May be repeated. Consent of instructor required. Prerequisite: 1Y:140 or equivalent. Same as 108:141.

1Y:150 Elementary Bookbinding 3 s.h.
Selected types of nonadhesive, unsupported book structures; history and terminology of bookbinding.

1Y:151 Intermediate Bookbinding 3 s.h.
Historical models; case-bound sewing and adhesive structures; book enclosures. May be repeated. Consent of instructor required. Prerequisite: 1Y:150 or equivalent. Same as 108:151.

1Y:152 Advanced Bookbinding 3 s.h.
Historical models; case-bound sewing and adhesive structures; book enclosures. May be repeated. Consent of instructor required. Prerequisite: 1Y:151 or equivalent. Same as 108:152.

Art Education

1E:195 Methods and Material: Art for the Classroom Teacher 2-3 s.h.
Projects, techniques, and processes in art for elementary and early childhood education majors; combination lecture and studio; painting, drawing, printmaking, sculpture, and crafts with materials and tools commonly available in the elementary school. Same as 7E:122.

1E:196 Concepts in Art Education 3 s.h.
Overview of art education: history of development in United States; child and adolescent art; relationships with art and education; survey of literature; community art teaching experiences.

1E:198 Art Education Studio 3 s.h.
Studio methods course relating art training to the processes of elementary and secondary school art teaching; application of studio methods to the teaching of children. Prerequisite: 1E:196.

1E:230 Art Education and the Museum **3 s.h.**
Methods of structuring appreciation experiences in museums for children and adults, including the conducting of tours. Consent of instructor required.

1E:406 Research in Art Education **arr.**
Individual research under supervision; applicable to thesis preparation and to doctoral prospectus development. May be repeated. Same as 7E:406, 7S:406.

ASIAN LANGUAGES AND LITERATURE

Chair: Maureen Robertson
Professor: W. South Coblin
Professors emeriti: Hsi Ch'eng, Y.P. Mei
Associate professors: Bing C. Chan, Robert Leutner, Maureen Robertson, Thomas H. Rohlich
Assistant professors: Osamu Kamada, Tonglin Lu, Philip Lutgendorf
Supporting faculty: David Arkush (History), Robert Baird (Religion), Wayne Begley (Art and Art History), Raoul Birnbaum (Religion), William Bodiford (Religion), William Deal (Religion), Paul Durrenberger (Anthropology), Paul Greenough (History), Chong Lim Kim (Political Science), Scott McNabb (Education), Robert Rorex (Art and Art History), Gerard Rushton (Geography), Stephen Vlastos (History), Margery Wolf (Anthropology)
Undergraduate degrees offered: B.A. in Asian Languages and Literature, Asian Studies
Graduate degree offered: M.A. in Asian Civilizations

Undergraduate Programs

The Department of Asian Languages and Literature offers two programs leading to the Bachelor of Arts degree, one primarily for students interested in studying the culture and civilization of traditional and modern Asia, and the other intended for those who want to concentrate on developing competence in one of the Asian languages offered.

Graduates of both programs find careers in education, government, banking, and commerce in America and Asia. The programs also provide an excellent background for advanced study in literature, history, art, religion, political science, geography, anthropology, and sociology. The department urges its undergraduate majors to study in Asia as early in their careers as possible, and every effort is made to facilitate transfer of credit with universities in Asia.

Major in Asian Studies

This major introduces students to East or South Asian cultures, both modern and traditional, and to the contemporary politics and societies of Asia. Courses are taught by Asian specialists in many departments. Students are encouraged to take courses in a number of disciplines and in more than one area of Asia.

Students majoring in Asian studies must complete 30 semester hours of courses on Asia, distributed as follows:

39:10-11 Second-Year Chinese	12 s.h.
or	
39:33-34 Second-Year Hindi	8 s.h.
or	
39J:10-11 Second-Year Japanese	12 s.h.
or	
39:23-24 Second-Year Sanskrit	6 s.h.

At least one course on the history of the area whose language they are studying, chosen from:

39:133 History of Ancient and Traditional India	3 s.h.
39:134 Imperialism and Modern India	3 s.h.
39:153 Traditional China	3 s.h.
39:154 Modern China: 1800 to Present	3 s.h.
39J:153 Premodern Japan	3 s.h.
39J:154 Modern Japan	3 s.h.

Other courses on Asia, 100 level or above:

For those taking Chinese or Japanese	15 s.h.
For those taking Hindi	19 s.h.
For those taking Sanskrit	21 s.h.

Many students find that an Asian studies major is conveniently combined with a major in history, political science, art history, religion, business, anthropology, or another discipline.

Major in Chinese, Hindi, Japanese, or Sanskrit

This major is intended for students who want to achieve an ability to speak, understand, read, and write Chinese, Hindi, or Japanese, or to read Sanskrit; and to gain knowledge of the literature of China, Japan, or South Asia. Majors are required to complete 30 semester hours of advanced courses, distributed as follows:

Students of Chinese

39:10-11 Second-Year Chinese	12 s.h.
39:105-106 Third-Year Chinese	12 s.h.
39:141 Chinese Literature: Poetry	3 s.h.
39:142 Chinese Literature: Prose	3 s.h.

Students of Hindi

39:33-34 Second-Year Hindi	8 s.h.
*39:184-185 Third-Year Hindi	6 s.h.
39:135-136 Indian Literature	6 s.h.
39:137 Indian Devotional Literature in Translation	3 s.h.

*With the approval of the major adviser, students may substitute 6 semester hours of 100-level courses in South Asian studies for third-year Hindi.

Students of Japanese

39J:10-11 Second-Year Japanese	12 s.h.
39J:105-106 Third-Year Japanese	12 s.h.
39J:141 Traditional Japanese Literature in Translation	3 s.h.
39J:142 Modern Japanese Fiction in Translation	3 s.h.

Students of Sanskrit

39:23-24 Second-Year Sanskrit	6 s.h.
*39:186-187 Third-Year Sanskrit	6 s.h.
39:135-136 Indian Literature	6 s.h.
39:163 Indian Religious Texts	3 s.h.

*With the approval of the major adviser, students may substitute 6 semester hours of 100-level courses in South Asian studies for third-year Sanskrit.

Students are urged to fulfill the General Education Requirement in historical perspectives by completing 16:5-6 Civilizations of Asia.

Minor in Asian Languages

A minor in Asian languages requires a minimum of 15 semester hours with a grade-point average of 2.00. Of the 15 semester hours, at least 12 must be taken at The University of Iowa in advanced courses. Students may earn minors in Chinese, Hindi, Japanese, or Sanskrit. The following courses are considered advanced for the minor.

Chinese

39:10 Second-Year Chinese	6 s.h.
39:11 Second-Year Chinese	6 s.h.

Hindi

39:33 Second-Year Hindi	4 s.h.
39:34 Second-Year Hindi	4 s.h.
39:184 Third-Year Hindi	3 s.h.

Students of Hindi are permitted to complete the advanced course requirement with 11 semester hours.

Japanese

39J:10 Second-Year Japanese	6 s.h.
39J:11 Second-Year Japanese	6 s.h.

Sanskrit

39:22 First-Year Sanskrit	4 s.h.
39:23 Second-Year Sanskrit	3 s.h.
39:24 Second-Year Sanskrit	3 s.h.
39:186 Third-Year Sanskrit	3 s.h.

Minor in Asian Studies

A minor in Asian studies requires a minimum of 15 semester hours with a grade-point average of 2.00. Of the 15 semester hours, at least 12 must be taken at The University of Iowa in advanced courses. Courses numbered 39:100 or 39J:100 and above are considered advanced for the minor. Students are encouraged to take 39:55 or 39:56 Civilizations of Asia as their lower-level course.

Honors

Students with a grade-point average of 3.20 or above are encouraged to enroll in the College of Liberal Arts Honors Program. With the permission of the departmental chair and a faculty sponsor selected from Asian specialists in any department, students register for 39:191 Honors Tutorial and 39:195 Senior Honors Thesis. To receive a B.A. with honors, students must complete an acceptable thesis based on original research in an appropriate area of Asian studies.

Certificate in International Business

Students of Chinese, Japanese, and Hindi may participate in a program leading to a Certificate in International Business, offered jointly by the College of Liberal Arts and the College of Business Administration. The wide range of electives in the program permits undergraduate students to tailor it to their individual interests and to complement majors in the Colleges of Liberal Arts and Business Administration (see the "College of Business Administration" section of the *Catalog*).

Graduate Programs

Master of Arts in Asian Civilizations

The graduate program in Asian civilizations provides preparation for doctoral study in a variety of disciplines. It is also of interest to students with nonacademic career plans for whom graduate-level work in an Asian language and culture would be useful. Students in professional programs are encouraged to consider working toward a concurrent degree in Asian civilizations.

The Master of Arts in Asian civilizations requires a minimum of 30 semester hours of approved course work, 24 of which must be taken in residence at The University of Iowa. By the end of the first semester in residence, students propose a plan of study developed in consultation with the adviser. The course of study must conform to one of the following ten specialized master's programs: Chinese literature, Chinese linguistics, Chinese language teaching, interdisciplinary studies in Chinese, Japanese literature, Japanese language and pedagogy, interdisciplinary studies in Japanese, Sanskrit language and literature, Hindi language and literature, and South Asian studies.

All students must maintain a 3.00 minimum grade-point average. Detailed information on degree requirements is sent to all applicants.

By the end of the final semester in residence, students are expected to demonstrate, either by departmental examination or the successful completion of courses at the appropriate level, advanced competence in Chinese, Japanese, Hindi, or Sanskrit, defined generally as corresponding to the fourth-year level of language course work in Chinese or Japanese and the third-year level in Hindi and Sanskrit.

Admission

Applicants for graduate admission must meet the general admission requirements of the Graduate College, except that a minimum grade-point average of 2.75 is required for conditional admission, 3.00 for regular admission. In addition, applicants must submit a writing sample in English—such as a term paper, seminar paper, or graduation thesis—to the Department of Asian Languages and Literature.

Both foreign and nonforeign graduate applications requesting financial support for the following academic year are due February 1. Nonforeign applications for admission without support are accepted until July 15 for the fall semester or December 1 for the spring semester. Foreign applications for admission without support are accepted until February 1 for the summer or fall semester and October 1 for the spring semester. Candidates should take the Graduate Record Examination (GRE) General Test early, since an admission decision usually cannot be made until scores are received.

Financial Aid

The Department of Asian Languages and Literature has available two kinds of support for graduate students in Asian civilizations: teaching assistantships and research assistantships. At the time of application, students should request information about special requirements for teaching assistantships.

Currently enrolled undergraduate and graduate students are eligible to compete for summer scholarship aid for intensive language study provided by the Stanley-University of Iowa Foundation Support Organization. Scholarships consist of a cash grant of $2,100.

Students selected to participate in the Iowa Critical Languages Program receive special financial support. Undergraduate students of Asian languages have available support from two special sources:

- Presidential Scholarships for Study Abroad in the amount of $1,000 may be used to help underwrite the costs of study abroad. Up to twenty such scholarships are available each year, and proposals for study in non-Western European countries are especially encouraged.
- Stanley Scholarships for International Research and Study carry stipends of up to $800 (to support summer study projects and activities away from The University of Iowa campus). Graduate students who combine work in modern Asian languages at an advanced level with interdisciplinary or professional study are encouraged to apply for Graduate Fellowships in Foreign Language Study awarded by the Center for International and Comparative Studies. The fellowships offer academic year and summer study stipends as well as full or partial tuition support. They may be held only by American citizens.

Special Programs and Activities

Iowa Critical Languages Program

The Iowa Critical Languages Program prepares students to teach Chinese, Japanese, or Russian in Iowa high schools. Each year two students in each language are admitted to the program, which leads to a bachelor's degree with a major in the language and Iowa certification at the secondary level. Applicants must be U.S. citizens or permanent residents of the United States. They may already hold a baccalaureate degree and teaching certification.

Through a grant from the Ford Foundation, participating students receive scholarships for a year of study abroad and two summers of intensive language study in programs recognized for their excellence in foreign language training. Participants in the program are obliged to teach in a cooperating Iowa school district for at least three years after graduation. Additional information is available from the Office of Academic Affairs, 111 Jessup Hall.

Summer and Study-Abroad Programs

The department strongly urges its students to seek opportunities for summer language study and study abroad in order to accelerate the process of language acquisition, and many of the financial aid programs described above are designed to help make such learning experiences possible. Both the department and the Office of International Education and Services maintain extensive files of information about study-abroad opportunities.

The University's memberships in the American Institute of Indian Studies and the China Cooperative Language and Study Programs consortium facilitate study abroad for Iowa students. The China programs provide opportunities to study language and culture in universities in Peking, Shanghai, and Nanjing. Of special note is the Chinese Business and Society Program at the University of International Business and Economics in Beijing, in which students may study Chinese business practice and language and arrange short-term internships in Chinese and foreign enterprises.

The UI-Nanzan Exchange allows Iowa students to pay Iowa tuition while attending the Center for Japanese Studies at Nanzan University in Nagoya, Japan. The center offers both intensive Japanese language instruction at all levels and courses in a wide variety of disciplines in Japanese studies taught in English. Home stays may be arranged for students who wish to experience life in a Japanese family.

Internships

Students are encouraged to enrich their programs of study through internships designed to combine work experience in Asia or the United States with study or research projects. The internship programs of the Office of Cooperative Education include a joint project with the Chicago office of the Japan Export Trade Organization to place Iowa students in Japanese businesses and other organizations.

Japanese Language House, Student Association

The Foreign Language House in Hillcrest Residence Hall includes a Japanese House that is a focal point for activities among both resident and nonresident students and the Japanese Students Association, including weekly dinners.

The Japanese Student Association is composed of American students of Japanese and members of the Japanese community at the University. It organizes social events, film showings, and other cultural programs.

Library Facilities

Since 1960 the Main Library has routinely acquired most American titles in Asian studies and selected overseas scholarly publications in English and other Western languages. The library's Asian collection includes approximately 80,000 volumes in Asian languages and about 120,000 Western-language volumes on Asian subjects. The University is a member of the Library of Congress Foreign Currency Exchange Program for Indian books and periodicals. The library's nonprint media collection includes a growing number of Asian feature films. A Chinese-Japanese-Korean computer terminal gives students and faculty access to the growing Research Libraries Information Network database in Asian languages.

Courses

Undergraduate Language

39:000 Cooperative Education Internship **0 s.h.**

39:1 Chinese I **4 s.h.**
Introduction to spoken Mandarin, with some instruction in writing characters. Offered spring semesters and summer sessions. GER: foreign language.

39:2 Chinese II **4 s.h.**
Further study of spoken Mandarin, with more emphasis on written language. Offered fall semesters. GER: foreign language. Prerequisite: 39:1.

39:8 First-Year Chinese **6 s.h.**
Sound system of Mandarin Chinese, basic grammatical patterns, reading and writing Chinese characters. GER: foreign language. Offered fall semesters.

39:9 First-Year Chinese **6 s.h.**
GER: foreign language. Offered spring semesters. Prerequisite: 39:2 or 39:8.

39:10 Second-Year Chinese **6 s.h.**
Continuation of 39:9, which is prerequisite; continues the audio-lingual approach of first-year Chinese; focus on vocabulary and sentence structure of modern Chinese through newspaper articles, documentary writing, and prose narratives. Offered fall semesters.

39:11 Second-Year Chinese **6 s.h.**
Offered spring semesters. Prerequisite: 39:10.

39:21 First-Year Sanskrit **4 s.h.**
Introduction to the classical language of India; grammar and basic vocabulary; elementary readings. GER: foreign language. Offered fall semesters.

39:22 First-Year Sanskrit **4 s.h.**
Graded readings in epic and story literature. GER: foreign language. Offered spring semesters. Prerequisite: 39:21.

39:23 Second-Year Sanskrit **3 s.h.**
Readings in epic and puranic texts. GER: foreign language. Offered fall semesters. Prerequisite: 39:22 or consent of instructor.

39:24 Second-Year Sanskrit **3 s.h.**
The *Bhagavadgita* and related religious-philosophical texts. GER: foreign language. Offered spring semesters. Prerequisite: 39:23 or consent of instructor.

39:31 First-Year Hindi **5 s.h.**
Introduction to the national language of India, with emphasis on both written and spoken Hindi. GER: foreign language. Offered fall semesters.

39:32 First-Year Hindi **5 s.h.**
Continuation of 39:31, which is prerequisite; continued emphasis on both written and spoken Hindi. GER: foreign language. Offered spring semesters.

39:33 Second-Year Hindi **4 s.h.**
Study of the Hindi language at the intermediate level, with emphasis on conversation and the reading of a variety of folktales and modern short stories. GER: foreign language. Offered fall semesters. Prerequisite: 39:32.

39:34 Second-Year Hindi **4 s.h.**
Continued advanced study of the Hindi language at the intermediate level. GER: foreign language. Offered spring semesters. Prerequisite: 39:33.

39:40 First-Year Korean **4 s.h.**
Offered through Saturday and Evening Class Program.

39:41 First-Year Korean **4 s.h.**
Offered through Saturday and Evening Class Program.

39:45 First-Year Modern Hebrew **3 s.h.**
Offered through Saturday and Evening Class Program.

39:46 First-Year Modern Hebrew **3 s.h.**
Offered through Saturday and Evening Class Program.

39:70 First-Year Arabic **3 s.h.**
Offered through Saturday and Evening Class Program.

39:71 First-Year Arabic **3 s.h.**
Offered through Saturday and Evening Class Program.

39:105 Third-Year Chinese **6 s.h.**
Reading of advanced modern Chinese texts, with further practice in speaking and writing. Offered fall semesters. Prerequisite: 39:11.

39:106 Third-Year Chinese **6 s.h.**
Offered spring semesters. Prerequisite: 39:105.

39J:1 Non-Intensive Japanese I **3 s.h.**
Introduction to the modern Japanese language: speaking, listening, reading, and writing. GER: foreign language. Offered spring semesters and summer sessions.

39J:2 Non-Intensive Japanese II **3 s.h.**
GER: foreign language. Continuation of 39J:1, which is prerequisite. Offered fall semesters.

39J:8 First-Year Japanese **6 s.h.**
Intensive introduction to modern Japanese. GER: foreign language. Offered fall semesters.

39J:9 First-Year Japanese **6 s.h.**
GER: foreign language. Offered spring semesters. Prerequisite: 39J:8 or 39J:2.

39J:10 Second-Year Japanese **6 s.h.**
Offered fall semesters. Prerequisite: 39J:9.

39J:11 Second-Year Japanese **6 s.h.**
Offered fall semesters. Prerequisite: 39J:10.

39J:105 Third-Year Japanese **6 s.h.**
Reading of more difficult modern Japanese, with further practice in speaking and writing. Offered fall semesters. Prerequisite: 39J:11.

39J:106 Third-Year Japanese **6 s.h.**
Offered spring semesters. Prerequisite: 39J:105.

39J:120 Conversational Japanese **arr.**
Advanced training in spoken Japanese for students who have completed two years of the language; includes extensive use of audiovisual materials. Prerequisite: 39J:11 or 39J:118.

Graduate Language

39:115 Beginning Chinese for Graduate Students I **6 s.h.**
Introduction to Chinese for graduate students; see 39:8. Offered fall semesters.

39:116 Beginning Chinese for Graduate Students II **6 s.h.**
See 39:9. Offered spring semesters. Prerequisite: 39:115 or 39:2.

39:117 Beginning Chinese for Graduate Students III **6 s.h.**
See 39:10. Offered fall semesters. Prerequisite: 39:116.

39:118 Beginning Chinese for Graduate Students IV **6 s.h.**
See 39:11. Offered spring semesters. Prerequisite: 39:117.

39:108 Classical Chinese **3 s.h.**
Introduction to classical Chinese of the late Zhou period; readings primarily from *Zhanguoce*, *Mengzi*, and *Zhuangzi*; stresses grammatical analysis and exact translation. Offered fall semesters. Prerequisite: 39:11.

39:109 Classical Chinese **3 s.h.**
Offered spring semesters. Prerequisite: 39:108.

39:123 Beginning Hindi for Graduate Students I **5 s.h.**
Introduction to Hindi for graduate students; see 39:31. Offered fall semesters.

39:124 Beginning Hindi for Graduate Students II **5 s.h.**
Continuation of 39:123, which is prerequisite; see 39:32. Offered spring semesters.

39:126 Intermediate Hindi for Graduate Students III **4 s.h.**
Second-year Hindi for graduate students; see 39:33. Offered fall semesters. Prerequisite: 39:124.

39:127 Intermediate Hindi for Graduate Students IV **4 s.h.**
Continuation of 39:126, which is prerequisite; see 39:34. Offered spring semesters.

39:184 Third-Year Hindi **3 s.h.**
Reading of advanced-level Hindi texts, with further practice in speaking and writing. Offered fall semesters. Prerequisite: 39:127.

39:185 Third-Year Hindi **3 s.h.**
Continuation of 39:184, which is prerequisite. Offered spring semesters.

39:188 Fourth-Year Hindi **3 s.h.**
Advanced training. Offered fall semesters. Prerequisite: 39:185.

39:189 Fourth-Year Hindi **3 s.h.**
Continuation of 39:188, which is prerequisite. Offered spring semesters.

39:211 Fourth-Year Chinese **3 s.h.**
Further development of language proficiency through reading of modern texts. Offered fall semesters. Prerequisite: 39:106 or equivalent as demonstrated by oral and written examinations.

39:212 Fourth-Year Chinese **3 s.h.**
Offered spring semesters. Prerequisite: 39:211.

39:213 Advanced Classical Chinese **3 s.h.**
Selected readings from *Zuozhuan*, *Guoyu*, and other texts of the early classical period. Prerequisite: 39:109.

39:220 Literary Chinese I **3 s.h.**
Selected readings from literary and historical texts of the Han and Wei-Jin periods. Prerequisite: 39:109 or consent of instructor.

39:221 Literary Chinese II **3 s.h.**
Selected readings from literary and historical texts of the Northern and Southern Dynasties, Tang, and Song. Prerequisite: 39:109 or consent of instructor.

39J:115 Beginning Japanese for Graduate Students I 6 s.h.
Introduction to Japanese for graduate students; see 39J:8. Offered fall semesters.

39J:116 Beginning Japanese for Graduate Students II 6 s.h.
See 39J:9. Offered spring semesters. Prerequisite: 39J:115 or 39J:2.

39J:117 Beginning Japanese for Graduate Students III 6 s.h.
See 39J:10. Offered fall semesters. Prerequisite: 39J:116.

39J:118 Beginning Japanese for Graduate Students IV 6 s.h.
See 39J:11. Offered spring semesters. Prerequisite: 39J:117.

39J:121 Advanced Japanese 3 s.h.
Advanced training in the modern language for students who have completed 39J:106; emphasis on active use of communication skills. May be repeated.

39J:122 Advanced Japanese 3 s.h.
Continuation of 39J:121, which is prerequisite. May be repeated.

39J:250 Classical Japanese 3 s.h.
Grammar and readings in classical Japanese. Consent of instructor required. Prerequisite: third-year Japanese.

39J:251 Readings in Modern Japanese 3 s.h.
Readings in modern Japanese texts for advanced students. Consent of instructor required. Prerequisite: third-year Japanese.

39:110 Beginning Sanskrit for Graduate Students I 4 s.h.
Introduction to Sanskrit for graduate students. Offered fall semesters.

39:111 Beginning Sanskrit for Graduate Students II 4 s.h.
See 39:22. Offered spring semesters. Prerequisite: 39:110.

39:112 Beginning Sanskrit for Graduate Students III 3 s.h.
See 39:23. Offered fall semesters. Prerequisite: 39:111.

39:113 Beginning Sanskrit for Graduate Students IV 3 s.h.
See 39:24. Offered spring semesters. Prerequisite: 39:112.

39:186 Third-Year Sanskrit 3 s.h.
Advanced readings in philosophical and literary Sanskrit. Offered fall semesters. Prerequisite: 39:24 or 39:113.

39:187 Third-Year Sanskrit 3 s.h.
Offered spring semesters. Prerequisite: 39:186.

Literature

39:18 Asian Humanities: India 3 s.h.
Major literary, religious, and philosophical texts of India in English translation. GER: foreign civilization and culture, humanities.

39:19 Asian Humanities: China 3 s.h.
Major literary and philosophical texts of China in English translation. GER: foreign civilization and culture, humanities.

39:20 Asian Humanities: Japan 3 s.h.
Major literary texts and related arts of premodern Japan. GER: foreign civilization and culture, humanities.

39:50 Non-Western Literary Traditions 3 s.h.
GER: humanities. Same as 48:50.

39:135 Indian Literature 3 s.h.
Selected readings in translation from the literature of the ancient and classical periods.

39:136 Indian Literature 3 s.h.
Selected readings in translation from the literature of the medieval and modern periods.

39:137 Indian Devotional Literature in Translation 3 s.h.
Readings in the poetry and performance of the *bhakti*, or devotional movement, which has dominated popular Hinduism since the eighth century. Same as 32:170.

39:140 The Literature of Taoism 3 s.h.
Readings in translation illustrating the pervasive influence of philosophical and religious Taoism in areas of traditional Chinese culture such as political theory, literature and the arts, alchemy and medicine, sexual custom, and combat. Same as 32:178.

39:141 Chinese Literature: Poetry 3 s.h.
Selected readings in classical and modern Chinese poetry; in translation. Same as 48:141.

39J:141 Traditional Japanese Literature in Translation 3 s.h.
Survey in English translation of major works of the Japanese literary tradition from the seventh century to early modern times. No knowledge of Japanese required.

39:142 Chinese Literature: Prose 3 s.h.
Readings in Chinese prose, primarily fiction, from third century B.C. to 1900 A.D.; in translation.

39J:142 Modern Japanese Fiction in Translation 3 s.h.
Survey in English translation of major Japanese works of fiction from the seventeenth century to the present. No knowledge of Japanese required. Same as 48:142.

39J:143 Topics in Japanese Literature in Translation 3 s.h.
In-depth study of selected topics in Japanese literature in English translation; content varies. May be repeated.

39:155 The Literary Tale 3 s.h.
Broad readings in storyteller literature; study of thematic, structural, and rhetorical characteristics of the tale. Same as 48:155.

39:158 East-West Literary Relations 3 s.h.
Topics in the comparative study of Asian and Anglo-European literatures. Same as 48:158.

39J:170 Readings in Japanese Religious Texts 3 s.h.
Same as 32:183.

39:180 Modern Chinese Writers 3 s.h.
Selected readings in modern Chinese fiction; in translation.

39J:184 Religious Themes in Japanese Literature 3 s.h.
Same as 32:184.

39J:185 Asian Buddhist Traditions 3 s.h.
Same as 32:185.

39J:188 Japanese Religious Literature in Translation 3 s.h.

39:240 Seminar in Chinese Fiction 3 s.h.
Selected novels and novelettes of the sixteenth to eighteenth centuries (Ming and Qing periods) discussed in alternate semesters. Prerequisite: ability to read original texts with limited help of dictionary.

39:241 Seminar in Chinese Literature arr.
Advanced studies in special topics. Prerequisites: minimum of two years of modern Chinese language and one year of classical Chinese, or the equivalent.

39J:245 Seminar in Japanese Literature 3 s.h.
Advanced study of Japanese literature; content varies. May be repeated. Consent of instructor required. Prerequisite: three years of Japanese.

39J:252 Readings in Japanese Literary Texts 3 s.h.
Reading and translation of classical or modern literary works for the advanced student. Consent of instructor required. Prerequisite: 39J:250 or 39J:251.

Civilization

Instruction is in English.

39:16 Introduction to Asian Art 3 s.h.
GER: foreign civilization and culture, historical perspectives. Same as 1H:16.

39J:50 Japan Today 3 s.h.
Introductory overview of life in modern Japan and analysis of the critical domestic and international issues facing the Japanese today.

39:55 Civilizations of Asia 3 s.h.
GER: foreign civilization and culture, historical perspectives. Same as 16:5.

39:56 Civilizations of Asia 3 s.h.
GER: foreign civilization and culture, historical perspectives. Same as 16:6.

39:64 Living Religions of the East 3 s.h.
GER: foreign civilization and culture, historical perspectives. Same as 32:4.

39:120 Chinese Painting I 3 s.h.
Same as 1H:120.

39:121 Chinese Painting II 3 s.h.
Same as 1H:121.

39J:123 Japanese Painting 3 s.h.
Same as 1H:123.

39J:124 Japanese Language and Culture 3 s.h.
Emphasis on sociolinguistics; language origins, language and culture contact, lexicon, speech levels, ethnography of speech events at a wedding. Same as 113:124.

39J:125 Japanese Society 3 s.h.
GER: foreign civilization and culture. Same as 113:125.

39:129 Ethnology of Southeast Asia 3 s.h.
GER: foreign civilization and culture. Same as 113:129.

39:132 Vietnam War in Historical Perspective 3 s.h.
Same as 16:182.

39:133 History of Ancient and Traditional India 3 s.h.
GER: foreign civilization and culture. Same as 16:193.

39:134 Imperialism and Modern India 3 s.h.
GER: foreign civilization and culture. Same as 16:194.

39:139 Chinese Historical Phonology 3 s.h.
Begins with the phonology of Mandarin and other major Chinese dialects and proceeds to reconstruction of Middle and Old Chinese; explores possible relationships between Chinese and other language families. No previous knowledge of Chinese required. Same as 103:139.

39:145 Chinese Cinema of the 1980s 3 s.h.
Films of the 1980s from mainland China and Taiwan.

39:150 Contemporary Asia News Colloquium 2 s.h.
Same as 16:181.

39:151 Chinese Society: Traditional and Socialist 3 s.h.
Description and analysis of traditional Chinese culture and society; emphasis on village life in the context of a major historical tradition; material from Taiwan and prerevolutionary China. Same as 113:126.

39:152 Chinese Society: Socialist 3 s.h.
Description and analysis of contemporary Chinese culture and society in the People's Republic of China; emphasis on effect of a revolutionary philosophy on lives of villagers and the urban working class. Same as 113:128.

39:153 Traditional China 3 s.h.
GER: foreign civilization and culture. Same as 16:195.

39:157 Chinese Calligraphy 1 s.h.
General brushwork and ink technique of traditional Chinese calligraphy.

39J:153 Premodern Japan 3 s.h.
GER: foreign civilization and culture. Same as 16:197.

39:154 Modern China: 1800 to Present 3 s.h.
GER: foreign civilization and culture. Same as 16:196.

39J:154 Modern Japan 3 s.h.
GER: foreign civilization and culture. Same as 16:198.

39J:156 Art of Japan 3 s.h.
Same as 1H:122.

39:159 Art of China 3 s.h.
Same as 1H:119.

39:160 Chinese Religious Texts: Wisdom of China 3 s.h.

39J:160 Japan: The Changing Tradition 2-3 s.h.
Japan since Perry, through videotapes and self-instructional material.

39:161 Chinese Religions 3 s.h.
GER: foreign civilization and culture. Same as 32:176.

39J:161 Religion in Japan 3 s.h.
GER: foreign civilization and culture. Same as 32:182.

39:162 Buddhist Sacred Texts 3 s.h.
Same as 32:180.

39:163 Indian Religious Texts 3 s.h.
Religious and philosophical works of ancient and medieval India in translation. Same as 32:171.

39:167 Religion in India 3 s.h.
GER: foreign civilization and culture. Same as 32:169.

39:168 Painting of India 3 s.h.
Same as 32:175, 1H:118.

39:169 Art of Southeast Asia 3 s.h.

39J:172 Japan 1800 to 1900 3 s.h.
Same as 16:172.

39J:173 Japan 1900 to 1945 3 s.h.
Same as 16:173.

39J:174 Japan 1945 to Present 3 s.h.
Same as 16:174.

39:178 Government and Politics of the Far East 3 s.h.
GER: foreign civilization and culture. Same as 30:143.

39:181 Art of India I 3 s.h.
Same as 32:174, 1H:115.

39J:187 Themes in Japanese Religion 3 s.h.
Same as 32:187.

39:199 Asian Studies arr.
Courses of particular interest to students of Asia; content varies.

39J:202 Japanese Linguistics for Pedagogy 3 s.h.
Introduction to Japanese linguistics, particularly syntax, discourse analysis, and sociolinguistics. Prerequisite: 39J:106 or consent of instructor.

39J:204 Current Issues in Japanese Language Pedagogy 2-3 s.h.

39:210 Seminar: Gender in Chinese Society 3 s.h.
Same as 113:210, 131:210.

39J:234 Seminar: Japanese Religions arr.
Same as 32:234.

39:239 Seminar in Chinese Linguistics: Historical Phonology 3 s.h.
Selected topics; one research paper required. No examinations.

39:250 Asian Research Seminar arr.
Topics and research methods in various disciplines.

39:254 Seminar: Modern Chinese History arr.
Same as 16:291.

39:255 Seminar: Problems in Oriental Art 2-3 s.h.
Same as 1H:216.

39J:257 Readings: Japanese History arr.
Same as 16:294.

39:258 Readings in Chinese History arr.
Same as 16:292.

39:263 Seminar: Buddhism arr.
Same as 32:233.

39:267 Seminar: Religion in India 3 s.h.
Same as 32:232.

39:295 Readings in the History of India arr.
Same as 16:295.

Individual Study for Advanced Students

39:191 Honors Tutorial arr.
Offered satisfactory-fail.

39:195 Senior Honors Thesis arr.

39:200 Methods of Teaching Chinese 3 s.h.
Introduction to basic principles of elementary language instruction. Prerequisite: 39:106 or equivalent.

39J:200 Methods of Teaching Japanese arr.
Introduction to the basic principles and methodologies of Japanese language instruction. Prerequisite: 39J:106 or equivalent.

39:215 Individual Chinese for Advanced Students arr.
Individually selected research and translation projects for students whose written and spoken Chinese is beyond fourth-year level. Consent of instructor required. Prerequisite: 39:212 or equivalent.

39J:215 Individual Japanese for Advanced Students arr.
Individually selected research and translation projects for students whose written and spoken Japanese is beyond fourth-year level. Consent of instructor required.

39:216 Individual Sanskrit for Advanced Students arr.
Individually selected research and translation projects for students whose Sanskrit is beyond third-year level. Consent of instructor required.

39:217 Individual Hindi for Advanced Students arr.
Selected readings in medieval and modern Hindi. Consent of instructor required.

39:291 M.A. Thesis arr.
Offered fall semesters.

39:292 M.A. Thesis arr.
Offered spring semesters.

ASTRONOMY

See "Physics and Astronomy."

BIOCHEMISTRY

Head: Alan G. Goodridge
Undergraduate degrees offered: B.A., B.S. in Biochemistry
Graduate degrees offered: M.S., Ph.D. in Biochemistry

Biochemistry is the study of the basic chemical processes that occur in all living systems. Currently one of the most active sciences, it also provides a foundation for other biosciences.

Biochemists generally work in laboratories and/or classrooms. Those with the bachelor's degree are often employed as research assistants in industry, government, education, and health service, or in secondary school teaching, for which certification is required.

Biochemists with advanced degrees—usually the doctorate—pursue teaching, research, and/or administrative careers in universities, medical schools, hospitals, private research agencies, and government laboratories; and in the food, drug, cosmetics, chemical, petroleum, and allied industries as well as in biotechnology companies.

Undergraduate Programs

The department offers both the Bachelor of Science and the Bachelor of Arts. Requirements are outlined below. Students choose the advanced science electives to supplement biochemical studies or as part of a minor or a double major program. Typical courses are 37:128 Fundamental Genetics or 22C:7 Introduction to Computing with Fortan. Courses need not be numbered above 100 to qualify, especially courses in the mathematical sciences.

Bachelor of Science

The B.S. degree program in biochemistry prepares students to work as biochemists in positions that require no further formal training. It is also an excellent background for graduate study in biochemistry and related sciences or for professional degree work in the health sciences.

In addition to the College of Liberal Arts General Education Requirements, the Bachelor of Science degree in biochemistry requires 84-85 semester hours earned in courses as follows:

22M:25-26 Calculus I-II	8 s.h.
or	
22M:35-36 Engineering Calculus I-II	8 s.h.
29:17-18 Introductory Physics I-II	8 s.h.
37:3 Principles of Animal Biology	5 s.h.
2:1 Introduction to Botany	4 s.h.
or	
61:157 General Microbiology	5 s.h.
or	
61:147 Survey of Immunology	4 s.h.
or	
72:130 Human Physiology	4 s.h.
or	
Other biological discipline	
4:13 Principles of Chemistry I	3 s.h.
4:14 Principles of Chemistry II	3 s.h.
4:16 Principles of Chemistry Lab I	2 s.h.
4:121-122 Organic Chemistry I-II	6 s.h.
4:131 Physical Chemistry I	3 s.h.
4:132 Physical Chemistry II	3 s.h.
4:141 Organic Chemistry Laboratory	3 s.h.
99:1 Orientation and Introduction to the Field of Biochemistry	0 s.h.
99:101 Technical Writing in Biochemistry	1 s.h.
99:102 Undergraduate Seminar	1 s.h.
(1 semester hour of 99:101 and 2 semester hours of 99:102 are required.)	
99:120 Biochemistry and Molecular Biology I	4 s.h.
99:130 Biochemistry and Molecular Biology II	4 s.h.
99:140 Experimental Biochemistry	4 s.h.
*99:155 Research: Independent Study (may be taken for honors)	at least 6 s.h.
Advanced science electives	15 s.h.

*Registration in 99:155 is permitted only if grades of A or B have been earned in 99:120, 99:130, and 99:140, or by consent of adviser and instructor.

Bachelor of Arts

In addition to the College of Liberal Arts General Education Requirements, the B.A. degree in biochemistry requires 65 semester hours earned in courses as follows:

22M:15 Mathematics for the Biological Sciences	4 s.h.
22M:16 Calculus for the Biological Sciences	3 s.h.
29:11-12 College Physics	8 s.h.
37:3 Principles of Animal Biology	5 s.h.

2:1 Introduction to Botany	4 s.h.
or	
61:157 General Microbiology	5 s.h.
or	
61:147 Survey of Immunology	4 s.h.
or	
72:152 Mammalian Physiology	4 s.h.
or	
Other biological discipline	
4:13 Principles of Chemistry I	3 s.h.
4:14 Principles of Chemistry II	3 s.h.
4:16 Principles of Chemistry Lab I	2 s.h.
4:121-122 Organic Chemistry I-II	6 s.h.
4:131 Physical Chemistry I	3 s.h.
99:1 Orientation and Introduction to the Field of Biochemistry	0 s.h.
99:101 Technical Writing in Biochemistry	1 s.h.
99:102 Undergraduate Seminar	1 s.h.

(1 semester hour of 99:101 and 2 semester hours of 99:102 are required.)

99:120 Biochemistry and Molecular Biology I	4 s.h.
99:130 Biochemistry and Molecular Biology II	4 s.h.
99:140 Experimental Biochemistry	4 s.h.
Advanced science electives	9 s.h.

In addition, B.A. students intending to go on to advanced degrees in the biological or health sciences are advised to include four semester hours or more of 99:155 Research Independent Study (senior research) in their programs.

Teacher Certification

Biochemistry majors, especially those in the B.A. program, may qualify for teacher certification by taking additional courses in teacher education. Students should consult with an adviser in the College of Education.

Honors Program

Qualified students may earn an honors degree in biochemistry. They must be enrolled in the College of Liberal Arts Honors Program and must do special work in 99:155 Research: Independent Study. Honors students present their research results in a report written in the form of a journal article and in an oral report presented at a special open departmental seminar.

Combined Programs

Students, especially those in the B.A. program, may include courses from other disciplines, such as business, prelaw, psychology, or journalism, thus preparing for one of the variety of vocations in which biochemistry has an impact.

Graduate Programs, Facilities, Faculty, Courses

See "Biochemistry" in the College of Medicine section of the *Catalog* for descriptions of the department's graduate programs and facilities, its faculty roster, and course listings.

BIOLOGY

Chair: John R. Menninger
Professors: George D. Cain, Jeffrey L. Denburg, Joseph Frankel, Gary N. Gussin, Richard G. Kessel, John R. Menninger, Roger D. Milkman, James Dawson Mohler, David R. Soll, Michael Solursh, Eugene Spaziani, Barbara A. Stay, Norman E. Williams, Chun-Fang Wu
Professors emeriti: Harold Beams, Richard V. Bovbjerg, Jerry J. Kollros, Luther O. Nolf
Associate professors: Jim Jung-Ching Lin, Robert E. Malone
Assistant professors: Aixa Alfonso-Pizarro, Jan Fassler, Steven Green, Alan Kay, Rodney N. Nagoshi
Adjunct assistant professor: E. Marlo Nelsen
Undergraduate degrees offered: B.A., B.S. in Biology
Graduate degrees offered: M.S., Ph.D. in Biology

Undergraduate Programs

The undergraduate degree programs in biology teach science, especially the science of living organisms. The courses of study prepare students for careers in biological sciences, health-oriented professions, and related fields. Lecture and laboratory courses offered by the department also serve students in other fields, including psychology, anthropology, and sociology, as well as students in nonscience studies who have a cultural interest in biological science. The undergraduate programs are administered jointly by the departments of Biology and Botany.

Graduates with bachelor's degrees may enter research or service careers at the technical level in educational, governmental, and industrial institutions or foundations. The programs also prepare students for certification or advanced degree programs leading to independent research in biological fields, teaching at all levels, and the health professions, such as medicine, dentistry, pharmacy, nursing, paramedical practice, medical technology, dental hygiene, and physical therapy.

Courses required for the major emphasize structures and processes common to living systems, at molecular, cellular, organismic, and population levels. Students also may follow their own interests by concentrating elective courses in areas such as genetics, development, physiology, ecology, molecular biology, or plant and animal systems.

Students interested primarily in field biology have opportunity for this emphasis through the program in ecology and evolutionary biology and use of the Macbride Nature Recreation Area. Varied courses emphasizing field biology are offered during the summer at the Iowa Lakeside Laboratory at Lake Okoboji.

Bachelor of Science

The B.S. program is designed to be more rigorous than the B.A. program (see "Bachelor of Arts" in this section of the *Catalog*). Accordingly, the B.S. may be the degree program of choice for students who plan to do graduate work. However, selection of degree program should be dictated more by the student's personal taste, since there is little indication that employers or admission committees prefer one degree over the other.

Required Courses in Biology

2:1 Introduction to Botany	4 s.h.
37:3 Principles of Animal Biology	5 s.h.
*37:128 Fundamental Genetics	3 s.h.
*37:129 Fundamental Genetics Laboratory	3 s.h.
or	
*37:130 Fundamental Genetics Laboratory: Molecular Genetics of Yeast	3 s.h.
*37:131 Evolution	4 s.h.
37:105 Cell Physiology	4 s.h.
Electives in biology, botany, microbiology, or geology (paleontology)	11 s.h.
Total	34 s.h.

*These courses are cross listed in the botany department.

The 11 elective semester hours in biology must be in courses numbered 100 or above and intended primarily for science students. Also, the elective credit may not include more than 3 semester hours in biology and botany honors courses, 2:153 Special Topics, and 37:199 Introduction to Research. The elective courses can include up to 4 semester hours of advanced course work in the physical sciences (physics, chemistry, geology), in specifically approved courses in the basic science departments of the College of Medicine, or in mathematics courses that have first-semester calculus as prerequisite.

Appropriate electives should carry elementary course prerequisites, be meant primarily for science majors, and not include the required courses in cognate sciences listed below. Students should choose elective courses in consultation with their advisers.

Required Courses in Other Disciplines

4:13-14 Principles of Chemistry I-II	6 s.h.
4:16 Principles of Chemistry Laboratory	2 s.h.
4:121 Organic Chemistry I	3 s.h.
99:120 Biochemistry and Molecular Biology I	4 s.h.
29:11-12 College Physics I-II	8 s.h.
or	
29:17-18 Introductory Physics I-II	8 s.h.
22M:25 Calculus I	4 s.h.
or	
22M:16 Calculus for the Biological Sciences	3 s.h.
or	
22M:35 Engineering Calculus I	4 s.h.
or	
22M:45 Accelerated Calculus I	4 s.h.

8W:10 Expository Writing (or equivalent)	3 s.h.
Total	29-30 s.h.

Bachelor of Arts

The B.A. program provides more options among the required courses than does the B.S. program. It also permits more flexibility in course selection for satisfying the elective hours requirement.

Required Courses in Biology

2:1 Introduction to Botany	4 s.h.
37:3 Principles of Animal Biology	5 s.h.
*37:128 Fundamental Genetics	3 s.h.
*37:131 Evolution	4 s.h.
An investigative laboratory course**:	
*37:129 Fundamental Genetics Laboratory	3 s.h.
or	
*37:130 Fundamental Genetics Laboratory: Molecular Genetics of Yeast	3 s.h.
or	
37:152 Endocrinology Laboratory	2 s.h.
or	
2:116 Field Ecology	4 s.h.
Electives in biology, botany, microbiology or paleontology	11 s.h.
Total	29-31 s.h.

*These courses are cross listed in the botany department.
**Students who earn more than 3 semester hours in investigative laboratory courses may apply those extra hours toward elective credit.

Of the 11 semester hours of elective credit, up to 6 may be earned in other natural sciences or mathematics; 3 of these 6 semester hours in nonbiological science may be in 26:104 Introduction to Philosophy of Science, or 16:132 The Scientific Revolution, or 16:133 Science in the Modern Age. Other restrictions and limitations in courses to satisfy the elective credit requirement apply as for the B.S. degree.

Required Courses in Other Disciplines

4:13-14 Principles of Chemistry I-II	6 s.h.
4:16 Principles of Chemistry Laboratory	2 s.h.
4:121 Organic Chemistry I	3 s.h.
99:110 Biochemistry	3 s.h.
or	
99:120 Biochemistry and Molecular Biology I	4 s.h.
or	
2:125 Plant Biochemistry	3 s.h.
29:11-12 College Physics I-II	8 s.h.
or	
29:17-18 Introductory Physics I-II	8 s.h.
63:161 Introduction to Biostatistics	3 s.h.
or	
31:142 Introduction to Statistics in Psychology	3 s.h.
or	
22S:148 Intermediate Statistical Methods	4 s.h.
or	
22M:25 Calculus I	4 s.h.
or	
22M:16 Calculus for the Biological Sciences	3 s.h.
or	
22M:35 Engineering Calculus I	4 s.h.
or	
22M:45 Accelerated Calculus I	4 s.h.
8W:10 Expository Writing (or equivalent)	3 s.h.
Total	28-30 s.h.

Suggested Course Schedule for Freshman Year

The following schedule is recommended for students seeking either the B.S. or B.A. degree in biology.

First Semester

Rhetoric (10:1 or 10:3)	4 s.h.
Chemistry (4:13)	3 s.h.
Botany (2:1)	4 s.h.
Mathematics	3-4 s.h.

Second Semester

Rhetoric or 8G:1 Interpretation of Literature or General Education Requirement in the humanities	3-4 s.h.
Chemistry (4:14, 4:16)	5 s.h.
Foreign language or General Education Course	3-4 s.h.
Mathematics	3 s.h.

Students who seek the B.S. degree and who are sufficiently prepared in mathematics to take calculus in their first semester are encouraged to take 37:3 Principles of Animal Biology in their second semester.

Minor

Students majoring in other subjects may earn a minor in biology. The biology minor requires 15 semester hours of credit in biology, botany, microbiology, and/or paleontology courses taken at The University of Iowa, including at least 12 semester hours in 100-level courses, and excluding those designed primarily for nonscience students. Biology courses taken at other institutions or taken on a pass/nonpass basis do not apply toward requirements for the biology minor.

Honors

The honors program in biology gives the superior student membership in a small, active group of undergraduates with common interests. Honors students associate with one of the department's research groups, gaining an introduction to the pursuits of practicing scientists: experiments, discussions of current research, work on specialized topics, and attendance at research lectures.

Students in the College of Liberal Arts Honors Program may earn an honors degree in biology by completing at least 6 semester hours of honors course work in the departments of Biology and/or Botany, including at least 2 semester hours in 37:196 or 2:196 Honors Laboratory Research, at least 2 semester hours in 37:197 Honors Reading in Biology or 2:197 Honors Readings in Botany, and at least 1 semester hour in 37:198 Honors Seminar in Biology or a graduate-level seminar. Three of the minimum 6 semester hours of honors course work may be counted toward the 11-semester-hour elective requirement for the B.S. or B.A. in Biology. Honors students in biology must maintain at least a 3.20 grade-point average overall and at least a 3.20 average in the biological sciences. A final research paper, approved by the research supervisor, is required and must be submitted to the honors program director.

Introduction to Research

The department offers 37:199 Introduction to Research to acquaint students majoring in biology with the nature of practicing scientists' work—through association with one of the department's research groups in experiments, discussion of current research, study of specialized topics, and attendance at research lectures.

Graduate Programs

The graduate programs of the department are designed to train scientists who can participate in research in private, educational, or government environments, and who are experienced in the skills required for teaching biology. In the last two decades, some 70 Ph.D. graduates of this department have subsequently been appointed to college or university faculties, while most of the others are in research positions. A substantial number of students completing their training with an M.S. degree have obtained technical or professional positions. Other graduates are teaching at the secondary-school level or in community colleges.

Prior to registration in August, all new graduate students in biology take a course-equivalency examination covering topics in four areas of biology: developmental biology, genetics, cell physiology or animal physiology, and evolution or ecology. On the basis of examination results, students may be excused from further work in one or all of these fields, or may be advised to take specific courses to enhance their backgrounds in these areas. Students must make up any undergraduate deficiencies in mathematics, chemistry, or physics during the first year. A student with a bachelor's degree outside of the biological sciences may request modification of certain area requirements; the student's degree committee will decide whether portions of the requirements may be waived.

All members of the biology faculty engage in research asking fundamental questions about major biological problems. Areas of departmental research include cell biology, developmental biology, genetics, molecular biology, neurobiology, ecology, physiology,

and parasitology. If appropriate, projects can involve work in other departments; graduate students sometimes are advised jointly by faculty in those departments.

On admission, each new graduate student is assigned a temporary adviser, chosen to complement the research interests of the student. The temporary adviser guides the student through initial requirements and acts as the student's advocate. For purposes of graduate student evaluation, research training is categorized by four designations: developmental biology, ecology and evolution, genetics, and physiology. The department expects new students to do research in three laboratories on a rotating basis during their first year.

A graduate affairs committee evaluates and advises students initially. After the first two semesters, students choose a permanent sponsor (adviser) and a Ph.D. advisory (dissertation) committee. Afterwards, responsibility for evaluation is shared by the dissertation committee and the sponsor's area committee.

Master of Science in Biology

Although the department emphasizes the Ph.D. degree, two M.S. programs are available.

M.S. with Thesis

The M.S. degree with thesis requires 30 semester hours of graduate credit and a thesis based on original research. Ordinarily, 6-8 semester hours are assigned to thesis research and writing. The remaining hours are selected in consultation with the student's advisory committee; the choice of courses is tailored to students' backgrounds and career goals.

Students receive academic credit for courses they are required to take, but credit awarded for courses required by the admissions committee to make up undergraduate deficiencies does not count toward the 30-semester-hour requirement. After the thesis is accepted, candidates must pass an oral examination based on the thesis and related subjects.

M.S. without Thesis

The M.S. degree without thesis requires 34 semester hours of graduate credit and a library research report for which no more than 4 semester hours of credit may be granted. Credit may be earned in graduate courses in biology or cognate sciences; these courses are determined in consultation with the student's thesis committee and are tailored to fit the student's background and career goals.

Credit earned in courses at the 100 level or above—with the exception of courses in biology required to make up deficiencies (see above)—may be included in the 34-semester-hour minimum if approved by the advisory committee. On completion of the hours requirement and acceptance of the research report by their faculty sponsor, students must pass a written examination covering their graduate program in biology, including the area of their report.

Doctor of Philosophy

Each Ph.D. student's formal course or proficiency requirements are determined by the dissertation committee on the basis of the student's background and current and prospective research interests. The dissertation committee also determines what portion of the formal course work or proficiency requirements students must complete before taking the comprehensive examination, which admits them to full candidacy for the Ph.D. degree. In this examination, students must demonstrate a knowledge of biology fundamentals and the analytic and synthetic skills necessary to become creative and independent scientists.

The program culminates in students' preparation of a dissertation based on original, independent research. Students must take a final examination, which covers the thesis and the specialized field the thesis represents, before the department can accept the thesis.

Financial Aid

All graduate students making satisfactory progress in the department receive support from teaching assistantships, fellowships, or research assistantships provided by the University or by individual research grants administered by faculty members. First-year students ordinarily are supported by department fellowships during the research rotation period. Stipends and full tuition are also available through federally funded, interdisciplinary training programs in cell and molecular biology and genetics.

Students who apply for one departmental award may be considered for others.

Most assistantships and other appointments for the following academic year are filled by the end of April, but opportunities occasionally exist for appointments at other times, including the beginning of the spring semester. Requests for appointments should include clear statements of research interest.

Admission

Applicants for graduate admission should have a grade-point average of at least 3.00 and a Graduate Record Examination (GRE) General Test (verbal plus quantitative) score higher than 1100. These criteria are not absolute; instead, they serve as general guidelines to the admissions committee, which also considers applicants' letters of recommendation, research experience, and other appropriate criteria. Applicants also should take the Graduate Record Examination advanced biology test and submit their scores. Although most applicants have completed undergraduate programs in biology, the department considers applicants with backgrounds in biophysics, botany, biochemistry, molecular biology, microbiology, and other related areas. Applications should be submitted by February 1.

Facilities

The department is housed in a cluster of three contiguous buildings. It has appropriate facilities for the care of many kinds of animals and special facilities for research with viruses, DNA sequencing and synthesis, electron microscopy, fruit flies, plants, and marine organisms. It has numerous walk-in and reach-in environmental chambers for special cell culture or plant and animal care needs.

The department is equipped to carry out state-of-the-art research in all areas in which graduate teaching is conducted. All modern equipment (ultracentrifuges, fluorescent microscopes, controlled environment rooms, scintillation counters) is available for graduate student research.

In addition to department facilities, a number of campuswide facilities exist. A DNA oligonucleotide synthesis and enzyme lab is available, as is oligopeptide synthesis and sequencing equipment, mass- and NMR Spectroscopy facilities, and a computerized image analysis facility. A hybridoma facility does fusions and screening and provides researchers with monoclonal antibodies. A campus fermentation lab grows large amounts of microorganisms (e.g., 100 liters) for use in protein isolation. The department has its own electron microscope facility, and there is a University electron microscopy/lab with scanning and transmission electron microscopes.

Computing facilities are available in the department and at the main campus computer building. Graduate students have their own computer room with IBM PCs and terminals linked to the campus mainframe. One of the only computerized motion analysis facilities in the world is available in the basement of the biology building. Finally, there are animal rooms and growth media preparation labs.

In short, the department and the University provide every resource necessary to do biological science from the molecular to the population level.

Iowa Lakeside Laboratory

Courses in field biology and aquatic biology at the Iowa Lakeside Laboratory extend the on-campus work in ecology. See "Iowa Lakeside Laboratory" in this section of the *Catalog*.

Courses

Primarily for Undergraduates

37:000 Cooperative Education Internship **0 s.h.**

37:1 Introductory Animal Biology 4 s.h.
Fundamental principles are emphasized: cells and macromolecules, energy metabolism, organismic physiology, genetics, development, ecology, and evolution. GER: natural sciences. An acceptable first course in biology for prenursing, predental hygiene, and speech pathology students; not acceptable for students majoring in biological sciences or for those in premedical, predental, preveterinary, prephysical therapy, premedical technology, and other health-professional programs. Recommended: 4:7.

37:3 Principles of Animal Biology 5 s.h.
Comprehensive introduction to biology for students majoring in biological sciences and for students preparing to enter medical, dental, veterinary, physical therapy, and medical technology programs; unity of life, biological structure, metabolism, regulation, genetics, and development; diversity of life. GER: natural sciences. Prerequisite: 4:13 or consent of instructor.

Elementary Topics of General Interest

These courses are not open to graduate students and do not provide credit toward a biology major.

37:40 Biology of the Brain 3 s.h.
Results of the application of scientific methodology to the study of the brain and how this information may be used to understand the relationship of mind and brain; the relative contributions of environmental and genetic determinants to behavior; the nature of mental disorders. GER: natural sciences. Open only to nonscience majors. Offered spring semesters.

37:81 Human Genetics 3 s.h.
Heredity in human families and populations; genetic basis of normal and abnormal traits; chromosome behavior; sex determination; lectures and discussions. GER: natural sciences. Offered fall semesters of even years.

For Undergraduates and Graduates

37:103 Comparative Vertebrate Anatomy 4 s.h.
Structure, function, and evolution of vertebrates; lectures, demonstrations, laboratory. Prerequisite: 37:1 or 37:3 or equivalent.

37:104 Introduction to Developmental Biology 3 s.h.
Lecture survey of fundamental mechanisms involved in differentiation, organogenesis, morphogenesis; mechanistic approach at the molecular, cellular, and tissue levels of organizations. Prerequisites: grade of C- or higher in 37:3 and 4:14.

37:105 Cell Physiology 4 s.h.
Functions common to all cells: metabolism and its control, cellular energetics, membranes and transport, excitation, signal transduction, synthesis of proteins in cells and organelles, expression of genetic information, cell cycle, movement, architecture; lectures, laboratory, and discussion. Offered spring semesters. Prerequisites: 37:128, 99:120, 22M:25 or 22M:16, and 29:17 or 29:11; or consent of instructor. Corequisite: 29:18 or 29:12.

37:107 Invertebrate Biology 4 s.h.
Survey of invertebrate phyla with emphasis on major evolutionary trends; structural, physiological, and behavioral adaptations; laboratory with significant use of living material is the basic part of the course. Prerequisite: 37:1 or 37:3 or equivalent.

37:108 Vertebrate Zoology 4 s.h.
Explanations for vertebrate diversity and success are sought in the evolutionary history and adaptive radiation of fish, amphibians, reptiles, birds, and mammals; physiological, morphological, behavioral, and life history adaptations; vertebrate zoogeography, systematics, patterns of reproduction, and social systems. Prerequisite: 37:3.

37:110 Ecology 3 s.h.
Behavioral, physiological, morphological, and life-historical adaptations of organisms to their physical and biological environments; ecology of interactions among species; ecology of communities and ecosystems; alteration of communities by humans. Prerequisite: 37:1 or 37:3 or equivalent.

37:112 Cell, Tissue, and Organ Biology 5 s.h.
Lectures and laboratory dealing with microscopic structure in relation to function in cells, tissues, and organs of various animals with emphasis on mammals. Prerequisite: 37:1 or 37:3 or equivalent.

37:114 Cell Biology 3 s.h.
Structures of cells and organelles in relation to their functions at the molecular and cellular levels; emphasis on higher eukaryotic cells. Offered spring semesters. Prerequisite: 37:3, and 4:14 or equivalent.

37:118 Parasitology 4 s.h.
Morphology, physiology, and general importance of parasites of humans and animals; laboratory is morphological and experimental; emphasis on host-parasite relationship. Prerequisite: 37:1 or 37:3 or equivalent.

37:119 Plant-Animal Interactions 3-4 s.h.
Ecology and evolution of plant-animal associations, including effects of herbivores on individual plants and communities, defense mechanisms of plants and adaptations of herbivores, evolution of herbivore feeding strategies, fruit dispersal, and pollination ecology. Offered fall semesters. Prerequisite: 37:131 or 2:131 or consent of instructor. Same as 2:119.

37:120 Cell Biology of Protozoa 3 s.h.
Protozoa, with emphasis on basic biological principles; focus on free-living amoebas, flagellates, and ciliates, with some parasitic forms included; major topics are evolution, locomotion and behavior, endocytosis, genetics, and development; basic cellular functions such as feeding, locomotion, conjugation, regeneration, and cell division are examined in demonstration sections using live material.

37:122 Cellular Basis of Tissue Organization 3 s.h.

37:124 Animal Physiology 3 s.h.
Animal structure and function on the organismal level: digestion, respiration, transport, osmoregulation, thermoregulation, movement, and sensation; general principles of physiology and their adaptation to environmental constraints. Offered fall semesters of even years. Prerequisites: 37:3 and college physics, or 37:105, or consent of instructor.

37:128 Fundamental Genetics 3-4 s.h.
Nature and function of the genetic material: classical, molecular, developmental, population, and evolutionary aspects. Prerequisites: 37:3 and 4:14. Same as 2:128.

37:129 Fundamental Genetics Laboratory 1-3 s.h.
Experiments with Drosophila and bacteriophages illustrate major genetic principles; for biology majors and others with appropriate interest. Offered spring semesters. Prerequisite: 37:128. Same as 2:129.

37:130 Fundamental Genetics Laboratory: Molecular Genetics of Yeast 3 s.h.
Experiments with the yeast *Saccharomyces cerevisiae* to illustrate fundamental concepts of genetics and provide intensive introduction to the tools of molecular biology; first-hand experience in the challenge of a research laboratory environment. Consent of instructor required. Prerequisite: 37:128. Same as 2:130.

37:131 Evolution 4 s.h.
Nature, evidence, analysis, implications, and molecular/genetic basis of biological evolution; historical record, phylogeny, speciation, adaptation, and investigative methods. Prerequisites: 37:128 and calculus. Recommended: biochemistry. Same as 2:131.

37:133 Topics in Ecology 3 s.h.
Topics in population and community ecology; lectures, critical analysis of readings, and writing. May be repeated. Corequisite: 37:110 or 37:131 or equivalent.

37:137 Adaptation and Natural Selection 4 s.h.
Analysis of patterns of adaptation using the comparative method; topics include evolution of sex, sex ratio, breeding systems, life history, sociobiology, group selection, coevolution. Prerequisite: 37:110 or 37:131 or population genetics.

37:143 Animal Behavior 4 s.h.
Examines physiological and adaptive bases of animal behavior; ethology, sensory physiology, neurobiology of the brain, learning, circadian rhythms, foraging strategies, aggression, sexual and parental behavior, kin selection, and eusociality. Prerequisite: 37:3 or 31:17 or 31:129.

37:150 Introductory Endocrinology 2 s.h.
Survey of glands of internal secretion; emphasis on vertebrate systems; actions of hormones in regulating growth and metabolism, organ to molecular levels. Prerequisite: 37:1 or 37:3 or equivalent. Recommended: organic chemistry.

37:152 Endocrinology Laboratory 2 s.h.
Representative experiments and methods; effects of hormones on structure, physiology, and metabolism. Pre- or corequisite: 37:150 or equivalent.

37:161 Plant Molecular Biology 3 s.h.
Current research in plant molecular and cellular biology; topics include genome structure, regulation of gene expression, molecular basis of development, and plant-microbial interaction. Prerequisite: 2:128 or 37:128 or 99:110 or consent of instructor. Same as 2:161.

37:162 Population Genetics and Molecular Evolution 3 s.h.
Properties of populations: genetic structure and dynamics; evolution of macromolecules; molecular clocks and evolutionary trees; theory, investigative methods, findings. Prerequisite: grade of C- or higher in 37:128 or equivalent.

37:164 Seminar in Plant Molecular Biology 1-2 s.h.
Same as 2:164.

37:170 Eukaryotic Molecular Biology 2-3 s.h.
Molecular structure and function of eukaryotic genomes, including biosynthesis of DNA, RNA, and proteins with emphasis on control of gene expression. Prerequisite: grade of C- or higher in 37:171 or 61:170, or consent of instructor. Same as 2:170.

37:171 Molecular Genetics 4 s.h.
Mechanism and regulation of RNA, DNA, and protein biosynthesis, with emphasis on methods of genetic analysis of these processes; application of modern recombinant DNA techniques to basic problems. Prerequisite: grade of C- or higher in 99:120 or 37:128, or consent of instructor. Recommended: fundamental genetics.

37:172 Topics in Molecular Genetics 2 s.h.
Areas of current interest chosen for detailed study; topics related to general mechanisms for control of RNA, DNA, and protein synthesis. Prerequisite: 37:171 or consent of instructor.

37:173 Molecular Biology of Phage Lambda 3 s.h.
Molecular genetics of bacteriophage lambda with emphasis on genetic and recombinant DNA methodology. Prerequisite: 99:130 and 37:128, or consent of instructor.

37:174 Aspects of Molecular Genetics 1-2 s.h.
One or more areas of DNA metabolism: replication, DNA repair, or genetic recombination. Prerequisite: grade of C- or higher in 37:128 or equivalent, or consent of instructor.

37:175 Topics in Evolutionary Genetics 1-2 s.h.
Weekly reports and discussion of research and thought on a topic of major interest; topic varies yearly. May be repeated. Prerequisite: grade of C- or higher in 37:162 or consent of instructor.

37:177 Insect Reproduction and Development 2 s.h.
Discussions on physiology of gametogenesis, embryogenesis, and metamorphosis, with emphasis on neuro-endocrine regulation. Consent of instructor required. Prerequisite: 37:3 or equivalent.

37:179 Topics in Molecular Evolution 1-2 s.h.
Current topics such as 16S and 16S-like RNA and phylogeny, comparative analysis of DNA sequences, clonal segments in chromosomes. May be repeated. Prerequisite: grade of C- or higher in 99:120 and 37:131, or consent of instructor. Recommended: 37:162.

37:180 Introduction to the Neurosciences 3 s.h.
Functioning of nervous systems at the molecular and cellular levels, as well as such expressions of brain activity as perception; experimental approaches of different disciplines and their contributions to this field, including neurophysiology, molecular neurobiology, neuroanatomy, developmental neurobiology. Offered spring semesters. Prerequisite: 37:3. Same as 132:180.

37:181 Neurophysiology 3 s.h.
Analyses of physiological properties of nerve cells and nervous systems; axonal conduction, synaptic transmission, sensory transduction, integrative processes, and higher functions. Offered spring semesters. Prerequisites: 37:180, 22M:25 or equivalent, and 29:12; or consent of instructor. Same as 132:181.

37:183 Seminar in Cell Biology 1-2 s.h.
Lectures, discussions, readings, and reports on selected topics in cell biology. Prerequisite: 37:114 or consent of instructor.

37:184 Topics in Neurobiology 1-2 s.h.
Reports on topics of current interest in neurobiology. Offered spring semesters. Consent of instructor required.

37:185 Neurobiology of Learning and Memory 2 s.h.
Reports on current research in the neurobiological mechanisms of learning and memory. Consent of instructor required.

37:190 Seminar: Cell Structure and Function 2 s.h.
Lectures, readings, and reports covering current literature in organelle structure and function; the cytoplasmic matrix and detailed organization, composition, and functional diversity of biological membranes. Prerequisite: 37:112 or consent of instructor.

37:193 Topics in Cell Motility 1 s.h.
Seminars presented by outside speakers on topics related to molecular and behavioral aspects of cell motility in systems ranging from bacteria to amoebae to neural growth cones. Open only to graduate students.

37:194 Topics in Developmental Biology 1-2 s.h.
Readings, reports, and discussions of selected topics in developmental biology with special current interest. Prerequisite: 37:104 or consent of instructor.

37:195 Pattern Formation in Development 2 s.h.
Problems of positioning of parts and development of pattern in both multicellular and unicellular organisms. Consent of instructor required.

37:196 Honors Laboratory Research 1-3 s.h.
Experimental and theoretical research in problems in biology; topics agreed between instructor and students; for honors candidates. May be repeated. Consent of instructor required.

37:197 Honors Reading in Biology 1-3 s.h.
Topics agreed between instructor and students; for honors candidates. May be repeated. Consent of instructor required.

37:198 Honors Seminar in Biology 1-2 s.h.
Discussions and readings centered on a single major topic in biology; for honors candidates. May be repeated.

37:199 Introduction to Research arr.
Topics agreed between instructor and students; primarily for biology majors. May be repeated. Consent of instructor required.

Primarily for Graduates

37:102 Lectures in Cell Physiology 3 s.h.
Consent of instructor required. Prerequisites: 37:128, 99:120, 22M:25 or 22M:16, 29:17 or 29:11, and graduate standing. Corequisite: 29:18 or 29:12.

37:214 Seminar: Ecological Writing and Criticism 0-2 s.h.
Same as 2:214.

37:215 Genetics Seminar 0-2 s.h.
Lectures, discussions, seminars on selected topics in genetics. May be repeated. Prerequisite: 37:128 or consent of instructor. Same as 61:215, 2:215, 99:215.

37:217 Seminar: Biology 0-1 s.h.
Weekly lecture on current research; invited speakers.

37:218 Electron Microscopy Techniques 3 s.h.
Lecture and laboratory on methods of tissue preparation for transmission and scanning electron microscopy, including fixation, embedding, ultra-thin sectioning and staining; theory, use, maintenance of electron microscopes; associated photographic techniques; lectures on advanced techniques such as immuno EM and freeze-fracture; class project required. Consent of instructor required. Prerequisite: a course in cell biology. Same as 2:218, 61:218.

37:225 Seminar: Endocrinology 2 s.h.
Selected topics of current research interest in basic physiology and biochemistry of hormone action. Prerequisite: 37:150 or equivalent.

37:230 Fundamentals of Tropical Biology: An Ecological Approach 8 s.h.
A field course in Costa Rica sponsored by the Organization for Tropical Studies; limited to 20 students selected from the United States and Latin America; application forms available from faculty in ecology area. Offered spring semesters and summer sessions. Open only to graduate students by competitive application. Same as 2:230.

37:233 Seminar: Ecology 2 s.h.
Current concepts in ecology. Prerequisite: 37:133 or consent of instructor.

37:237 Current Topics in Evolution 1-2 s.h.
Current topics in evolutionary biology. May be repeated. Consent of instructor required. Prerequisite: graduate standing. Same as 2:237.

37:245 Developmental Neuroscience 2 s.h.
Same as 60:245, 132:245.

37:260 Developmental Genetics 2 s.h.
Lectures, readings, discussions on gene action in development. Prerequisite: 37:128 or equivalent.

37:265 Neuroscience Seminar 0-1 s.h.
Open student-faculty discussion of current literature in research areas bearing on neurosciences and behavior. Same as 31:265, 60:265, 72:265, 132:265.

37:272 Seminar in Cellular and Molecular Biology 1 s.h.
Information transfer and regulation, assembly and developmental processes, membranes and transport; presentation of research results by students, faculty, visitors. For students in cellular and molecular biology research training program; open to others with consent of instructor. May be repeated. Same as 60:272, 61:272, 71:272, 72:272, 99:272.

37:301 Research: Biology arr.

37:303 Independent Study in Biology arr.

BOTANY

Chair: Wei-yeh Wang
Professors: Richard G. Baker, Robert W. Cruden, Jeffry T. Schabilion, Wei-yeh Wang
Professor emeritus: Robert M. Muir
Associate professors: Wayne R. Carlson, Robert W. Embree, Stephen D. Hendrix, Diana G. Horton, Thomas E. Melchert, Jonathon E. Poulton, Richard D. Sjolund
Assistant professor: Ming-Che Shih
Adjunct assistant professor: Kenneth Jensen
Undergraduate degrees offered: B.A., B.S. in Botany
Graduate degrees offered: M.S., Ph.D. in Botany

Botany is a science that contributes to our understanding of plants, their significance in the earth's biosphere, their structure, function, reproduction, diversity, evolution, ecology, and relationships with human affairs. Careers for botanists include teaching and research positions in colleges, universities, governmental agencies, and industrial firms. Students majoring in botany often prepare to work in fields related to the plant sciences, such as agriculture, forestry, horticulture, plant breeding, microbiology, the chemistry of natural products, ecology, medicine, environmental law, and pharmacy.

Biology Degree Programs

Undergraduate and graduate degree programs in biology are administered jointly by the Departments of Botany and Biology. Degrees offered include the Bachelor of Arts (B.A.), Bachelor of Science (B.S.), Master of Science (M.S.), and the Doctor of Philosophy (Ph.D.). For information on these degree programs, see "Biology" in this section of the *Catalog*.

Undergraduate Programs

Bachelor of Science

In addition to the General Education Requirements of the College of Liberal Arts, students seeking the B.S. degree are required to take the following.

Botany and Biology Requirements

2:1 Introduction to Botany	4 s.h.
37:3 Principles of Animal Biology	5 s.h.
2:128 Fundamental Genetics	3 s.h.
2:113 Plant Anatomy	4 s.h.
2:100 Land Plants: An Evolutionary Survey	4 s.h.
2:102 Algae and Fungi	4 s.h.

One course from each of the following three areas:

Taxonomy

2:101 Plant Taxonomy	2,4 s.h.
2:151 Summer Flora	3 s.h.
L:105 Plant Taxonomy	5 s.h.

Physiology

2:109 Plant Physiology	4 s.h.
2:110 Plant Physiology	4 s.h.
2:114 Cellular Plant Physiology	4 s.h.
37:105 Cell Physiology	4 s.h.

Ecology

2:111 Plant Ecology	4 s.h.
37:110 Ecology	3 s.h.
2:116 Field Ecology	4 s.h.
2:150 Tutorial Undergraduate Research	2-4 s.h.
or	
2:196 Honors Laboratory Research	1-3 s.h.
or	
An investigative laboratory or field course	

Chemistry Requirements

4:13 Principles of Chemistry I	3 s.h.
4:14 Principles of Chemistry II	3 s.h.
4:16 Principles of Chemistry Lab	2 s.h.
4:121 Organic Chemistry I	3 s.h.
99:110 Biochemistry	3 s.h.
or	
99:120 Biochemistry and Molecular Biology I	4 s.h.
or	
2:125 Plant Biochemistry	3 s.h.

Mathematics Requirements

22M:15 Mathematics for the Biological Sciences	4 s.h.
or	
22M:19 Elementary Functions	3 s.h.
22S:102 Introduction to Statistical Methods (or equivalent)	3 s.h.
or	
22M:16 Calculus for the Biological Sciences	3 s.h.
or	
22M:25 Calculus I (or equivalent)	4 s.h.

Bachelor of Arts

The B.A. curriculum provides a broad background in botany yet allows more electives than does the B.S.

In addition to the general requirements of the College of Liberal Arts, students majoring in botany are required to take the following.

Botany and Biology Requirements

2:1 Introduction to Botany	4 s.h.
37:3 Principles of Animal Biology	5 s.h.
2:128 Fundamental Genetics	3 s.h.
2:113 Plant Anatomy	4 s.h.

One course from each of the following four areas (17-20 semester hours), and one additional 100-level course in botany or cognate sciences.

Physiology and Cell Biology

2:109 Plant Physiology	4 s.h.
2:110 Plant Physiology	4 s.h.
2:114 Cellular Plant Physiology	4 s.h.
2:125 Plant Biochemistry	3 s.h.
37:105 Cell Physiology	4 s.h.

Vascular Plant Diversity

2:100 Land Plants: An Evolutionary Survey	4 s.h.
2:101 Plant Taxonomy	4 s.h.
2:151 Summer Flora	3 s.h.
2:120 Paleobotany	4 s.h.
L:105 Plant Taxonomy	5 s.h.

Ecology and Evolution

2:111 Plant Ecology	4 s.h.
37:110 Ecology	3 s.h.
2:131 Evolution	4 s.h.
2:116 Field Ecology	4 s.h.

Biology of Nonvascular Plants

2:102 Algae and Fungi	4 s.h.
2:106 Bryology-Lichenology	4 s.h.
2:112 Field Mycology	3 s.h.

Chemistry Requirements

4:13 Principles of Chemistry I	3 s.h.
4:14 Principles of Chemistry II	3 s.h.
4:16 Principles of Chemistry Lab	2 s.h.
4:121 Organic Chemistry I	3 s.h.
4:122 Organic Chemistry II	3 s.h.
or	
99:110 Biochemistry	3 s.h.
or	
99:120 Biochemistry and Molecular Biology I	4 s.h.
or	
2:125 Plant Biochemistry	3 s.h.

Mathematics Requirements

One of the following courses (students should consult with their adviser):

22M:15 Mathematics for the Biological Sciences	4 s.h.
22M:16 Calculus for the Biological Sciences	3 s.h.
22M:19 Elementary Functions	3 s.h.
22M:25 Calculus I	4 s.h.

Teacher Certification

Students preparing to teach in secondary schools should consult the "College of Education" section of the *Catalog* regarding requirements for teacher certification.

Honors

An undergraduate program leading to graduation with honors provides opportunities for participation in independent research projects guided by faculty members.

In addition to the regular requirements for the B.A. and B.S. degrees, honors students must:

Maintain an overall grade-point average of 3.20;

Maintain a minimum grade-point average of 3.20 in all botany and biology courses;

Complete 4-6 semester hours of honors course work that includes a minimum of 4 semester hours in 2:196 Honors Research;

Submit a written research proposal and a written research report (honors thesis), which have been approved by the student's research supervisor, to the botany honors adviser; and

Defend the honors thesis before a committee composed of the botany honors research adviser, the student's research supervisor, and a third faculty member chosen by the student and the honors adviser.

Minor

The botany minor requires 15 semester hours of credit in botany with a minimum grade-point average of 2.00, at least 12 of which must be taken at The University of Iowa in courses numbered 2:100 and above.

Graduate Programs

An advanced degree enhances career opportunities in botany. The department offers advanced degree work in anatomy, bryology, cell biology, ecology, genetics, plant molecular biology, development and morphogenesis, mycology, paleobotany, palynology, physiology, plant biochemistry, and taxonomy. Graduate training frequently involves interdisciplinary study that requires some course work in cognate departments. Each graduate student is assigned a faculty guidance committee to help him or her set educational goals and plan the course requirements necessary to meet them.

Master of Science

The botany department offers two distinct M.S. degree programs, one with thesis and one without. The M.S. with thesis places greater emphasis on independent research and less on formal course work. It is intended primarily for candidates who have a strong course background in botany or biology.

Master's Degree without Thesis

Each student must:

Submit a program of study approved by a guidance committee composed of three members of the graduate faculty, one of whom may be from another department; the program of study should be prepared during the first semester in residence as a regular graduate student;

Complete at least 34 semester hours of graduate courses in botany or supporting areas, as prescribed by the guidance committee; six hours of research (2:225) are required; additional research hours may be taken, but no more than 6 may be counted toward the 34-semester-hour degree requirement;

Achieve a grade-point average of 3.00 on all courses—other than research—completed prior to the final examination;

Pass a written examination during the term in which the student is to graduate (individual committee members may opt not to give a written examination in their area), followed within a week by an oral examination; these examinations cover the student's courses and research experience.

Master's Degree with Thesis

Each student must:

Submit a program of study (as for the M.S. without thesis, above);

Complete at least 30 semester hours of graduate courses in botany or supporting areas, as prescribed by the guidance committee; 9 semester hours of research and thesis (2:225 and 2:229) are required; additional research hours may be taken, but no more than 9 may be counted toward the 30-semester-hour degree requirement;

Achieve a grade-point average of 3.00 on all courses—other than research—attempted up to the time of the final examination;

Prepare a thesis on research conducted;

Defend the thesis in an examination during the term in which the student is to graduate.

Doctor of Philosophy

The Ph.D. is primarily a research degree. The student must conduct original research of sufficient magnitude and value to allow a thesis to be written and successfully defended before the final examination committee. In addition, the student must complete 72 semester hours of graduate course work and research as prescribed by the guidance committee. Hours earned for the master's degree may be counted toward the 72-semester-hour minimum. The guidance committee also may require that course work beyond the 72 semester hours be taken to meet specific proficiency requirements (e.g., language or statistics) or to make up for background deficiencies

(e.g., chemistry or general botany course work).

The student must fulfill the specific degree requirements as follows:

Submit a program of study for the Ph.D. to a guidance committee during the first semester in residence as a Ph.D. candidate; the program must be approved by the guidance committee;

Fulfill all course work requirements of the program above; changes may be made only with the formal (written) approval of the guidance committee;

Complete an initial research proposal within two or three semesters after admission to the Ph.D. program (i.e., post-M.S.); the proposal, which should outline the specific objectives, significance, and methodology of the chosen research project, should gain written acceptance from members of the guidance committee; subsequently, copies of the accepted proposal must be distributed by the candidate to all faculty members of the botany department;

Give an oral presentation of the proposed research work to members of the botany department within a six-month period following acceptance of the initial research proposal; the candidate is thereby eligible for 1 semester hour of credit under 2:221 Seminar: Botany (see section on botany seminars);

Pass a written and oral comprehensive examination when formal course work has been completed or nearly completed;

Submit a doctoral thesis based on original research to the final examination committee for review;

Present the results of the thesis research at a meeting of the botany seminar, preferably before the thesis defense;

Pass the final doctoral examination, which is primarily a defense of the ideas, methods, and significance of the doctoral thesis.

Graduate Admission

University Requirements

An application form for admission to the Graduate College must be completed and sent to the Director of Admissions, The University of Iowa, Iowa City, Iowa 52242. Official transcripts from each undergraduate and graduate institution attended and scores on the Graduate Record Examination (GRE) General Test (verbal and quantitative parts) should be submitted with the application. A valid B.S. or B.A. degree from an accredited institution is required.

Departmental Requirements

Master's Degree Program

A cumulative grade-point average of at least 3.00 on all college-level work attempted;

A GRE General Test score (verbal plus quantitative) of 1100 or greater; and

Three letters of recommendation.

Provision: The numerical requirements are not absolute. For example, a student may compensate for a GRE General Test score slightly below 1100 with a high level of academic achievement.

Students applying for admission to the master's program in botany must have a bachelor's degree in one of the biological sciences. Students with bachelor's degrees in other areas will need to register as special students (A9) and make up the equivalent of the department's bachelor's degree program prior to consideration for admission. In addition to the botany and biology courses listed in the undergraduate program, special students must complete the chemistry and mathematics requirements. Students should consult the department chair before attempting to set up a program as special students.

Ph.D. Program

A grade-point average of at least 3.40 on graduate work;

A GRE General Test score of at least 1200;

Three letters of recommendation; and

A master's degree in botany or a biological science.

Provision: The numerical requirements are not absolute. For example, a student may compensate for a GRE General Test score slightly below 1200 with a high level of academic achievement, especially during the M.S. program.

Special Provision for Foreign Students

Admission for foreign students is based on a quantitative score on the GRE General Test of 650 or greater and a Test of English as a Foreign Language (TOEFL) score of 550 or greater. These scores may be used in place of the total GRE requirement, as outlined above.

Financial Aid

New students wishing to apply for assistantships or fellowships may submit an application for graduate awards form when applying for admission to graduate study. The application forms may be obtained from the Office of Admissions, the Graduate College, or the departmental office. Applications for teaching assistantships are reviewed by the faculty; those for research assistantships and fellowships are reviewed by the Graduate College, upon recommendation by the department faculty.

The kinds and amounts of support for graduate study in botany, as in other departments, vary from year to year, depending on the availability of funds. The types of appointments and support are teaching assistantships and research assistantships (one-half-time or one-quarter-time); summer research fellowships; genetics research assistantships; and other sources of support.

- Teaching and research assistantships. Appointment to an assistantship requires that the student provide approximately 20 hours of work per week. Appointees pay resident tuition rates.
- Summer research fellowships. These are available for outstanding graduate students. Recipients are expected to do full-time research for any two-month period between mid-May and mid-August and to enroll for at least 2 semester hours of credit in 2:225 Research: Botany. Awards are made on a competitive basis.
- Genetics research assistantships. These are awarded by the interdepartmental genetics program from University funds. Any student whose thesis project is primarily concerned with genetics is eligible to apply.
- Summer appointments. These depend on available summer session budgets; the department has awarded as many as four teaching assistantships in recent summer sessions. Summer session stipends are two-ninths of the academic year salary. Awards are made for one-half-time service or 20 hours of time per week for the eight-week summer session. Selection of teaching assistants for the summer is made by the instructor in charge of the course to be served.
- Faculty members with individual grants-in-aid. Faculty may wish to employ one-half-time or one-quarter-time research assistants. These awards are made by the principal investigator in charge of the grant and carry stipends similar to those available from departmental resources. Graduate College and departmental regulations and standards apply to these appointments.
- Grants-in-aid for graduate students. Agencies such as NIH, NSF, and Sigma Xi make grants-in-aid to graduate students. Announcements of availability are made from time to time. Students should consult the department chair for details. The Graduate College also provides information regarding grants available to graduate students.

Special Facilities and Activities

The Chemistry-Botany Building houses an excellent botany library.

Students conducting research projects that require plant cultivation have access to greenhouses and special culture rooms with controlled environments. A plant physiology laboratory with associated greenhouses is available.

A number of research laboratories are equipped with standard as well as sophisticated apparatus for research in growth regulation, photosynthesis, plant biochemistry, plant molecular biology, biochemical systematics, paleobotany, cytogenetics, ecophysiology, pollination biology, morphogenesis, and cell biology. A transmission electron microscope resides in

a special laboratory. Students and staff also use the scanning electron microscopy laboratory in the Bowen Science Building.

An herbarium for research and general study contains more than 200,000 specimens. Standard specimens include extensive collections of seed plants and ferns from Iowa and the Midwest, and there are special research specimens from Mexico and Central America and the Conard herbarium of bryophytes. There is also a growing repository of fossil paleozoic plants.

A forest preserve is available within a few miles of the campus for field trips and experimental projects. A biological field station at Iowa Lakeside Laboratory on West Lake Okoboji in northwestern Iowa affords excellent conditions for summer study in field biology, limnology, phycology, aquatic ecology, pollination biology, and plant taxonomy (see "Iowa Lakeside Laboratory" in this section of the *Catalog*).

Qualified graduate students may use the Weeg Computing Center in their research projects.

Courses

Primarily for Undergraduates

2:1 Introduction to Botany **4 s.h.**
Biology of plant life emphasizing structure, function, reproduction, diversity, and inheritance. Recommended for students in science and biology and for those preparing to teach science. GER: natural sciences.

2:3 Iowa Flora **2 s.h.**
Field and laboratory study of native and cultivated trees, shrubs, and flowering herbs found in Iowa; focus on identification, recognition, reproductive biology, and evolutionary relationships.

2:80 Plant Propagation **2-3 s.h.**
Study of vegetative and seed propagation techniques; cuttings, budding and grafting, sterile culture techniques, seed quality, seed dormancy, and seedling biology.

2:87 Spring Flora **3 s.h.**
Recognition and identification of spring-flowering herbaceous plants, native woodland trees and shrubs, and woody landscape plants; students learn family characteristics and how to use a taxonomic key; four Saturday morning field trips.

2:95 Plants and Human Affairs **2-3 s.h.**
How plants are useful to man: as food, for clothing and shelter; social, economic, and ecological significance of plants.

For Undergraduates and Graduates

2:100 Land Plants: An Evolutionary Survey **4 s.h.**
Survey of the major groups of land plants, including bryophytes, ferns and fern allies, gymnosperms, and primitive angiosperms; emphasis on evolutionary implications of structure, reproductive biology, and ecological adaptations; discussion of extant representatives of each plant group, with reference to paleobotanical evidence. Prerequisite: 2:1 or equivalent.

2:101 Plant Taxonomy **2,4 s.h.**
Laboratory and field analysis of evolutionary diversity within species, genera, and families of ferns, conifers, and flowering plants; emphasis on integration of data from comparative morphology, cytotaxonomy, and biochemical systematics; identification and recognition of major plant families. Prerequisite: 2:1 or equivalent.

2:102 Algae and Fungi **4 s.h.**
Survey of algae, fungi, myxomycetes, and lichens, with emphasis on morphology and reproductive biology of representatives of major taxonomic groups; lectures and laboratory experience with living and preserved organisms. Prerequisite: 2:1 or 37:3 or equivalent.

2:103 Biogeography **3 s.h.**
Patterns of plant and animal distribution and their interpretation; topics in historical geography, including glaciation and plate tectonics; topics in ecological geography, including physical factors such as climate and geology. Prerequisite: 2:1 or 44:3 or consent of instructor. Same as 44:103.

2:104 Cytogenetics **2 s.h.**
Structure and function of chromosomes; process of recombination; chromosome aberrations; heterochromatin; meiotic mutants; chromosome banding and transposons. Prerequisite: 2:128.

2:106 Bryology-Lichenology **4 s.h.**
Lectures, laboratories, and field studies emphasizing structure, reproductive biology, ecological adaptations, and evolutionary relationships of mosses, liverworts, and lichens. Prerequisite: 2:1 or consent of instructor.

2:109 Plant Physiology **4 s.h.**
Experimental study of function in plants; cell physiology, water relationships, and chemical syntheses. Prerequisite: 2:1 or equivalent.

2:110 Plant Physiology **4 s.h.**
Experimental study of mineral nutrition, metabolism, growth, and development of seed plants. Prerequisite: 2:1 or equivalent.

2:111 Plant Ecology **4 s.h.**
Interactions between organisms and their environments; topics include communities, succession, climax, genecology, breeding systems, pollination systems, ecological interactions. Prerequisite: 2:1 or equivalent. Recommended: a genetics course.

2:112 Field Mycology **3 s.h.**
Survey of local fungi; emphasis on recognition and identification of mushrooms and other macroscopic fungi; critical macroscopic and microscopic observation and use of taxonomic keys in field and laboratory classes. Prerequisite: an introductory biology course.

2:113 Plant Anatomy **4 s.h.**
Structure and organization of fundamental tissue systems of vascular plants, with emphasis on seed plants; topics include development and differentiation of each cell type and arrangement of these in primary and secondary plant body; focus on relationships between structure and function. Prerequisite: 2:1 or equivalent.

2:114 Cellular Plant Physiology **4 s.h.**
Introductory course in cellular plant physiology with emphasis on structure and function of plant cells and organelles; topics include photosynthesis, respiration, water relations, translocation, cell culture, and development. Prerequisites: 2:1 and 4:13, or consent of instructor.

2:115 Seminar: Plant Cell Structure and Function **1 s.h.**
Lectures, discussions, and seminars on selected topics in biology of plant cells and organelles. May be repeated. Prerequisites: 2:113, 2:114, and 2:125; or consent of instructor.

2:116 Field Ecology **4 s.h.**
Correlation of vegetation and environmental factors; delineation of plant communities and populations; population dynamics and analysis of field data; methods for describing ecological phenomena in quantitative terms; introduction to statistics. Prerequisite: 2:111 or 37:110 or consent of instructor.

2:118 Experimental Techniques **2 s.h.**
Chemical analysis, enzyme studies, and measurement of photosynthesis and respiration. Consent of instructor required.

2:119 Plant-Animal Interactions **3-4 s.h.**
Ecology and evolution of plant-animal associations, including effects of herbivores on individual plants and communities; defense mechanisms of plants and adaptations of herbivores; evolution of herbivore feeding strategies; fruit dispersal and pollination ecology. Prerequisite: 2:111 or 37:110 or 2:131 or consent of instructor. Same as 37:119.

2:120 Paleobotany **4 s.h.**
Evolutionary survey of plants starting with the origin and early evolution of life; includes both biological and geological significance of major plant groups. Offered fall semesters. Prerequisite: 2:1 or equivalent or consent of instructor. Same as 12:127.

2:121 Quaternary Palynology **5 s.h.**
Nature, origin, and use of pollen and spores in Quaternary time; field and laboratory study of pollen-bearing deposits; application to geological, ecological, botanical, and archaeological problems. Prerequisite: college geology or botany. Same as 12:128.

2:125 Plant Biochemistry **3 s.h.**
Lecture course introducing primary processes within plant biochemistry, including photosynthesis, carbohydrate, lipid, protein, and nucleic acid metabolism, nitrogen fixation; special emphasis on nature and subcellular localization of processes unique to plant metabolism. Prerequisite: 4:121 or 99:110 or 99:120 or consent of instructor.

2:126 Secondary Plant Products **2-3 s.h.**
Lecture course introducing secondary plant products (e.g., flavonoids, alkaloids, cyanogenic glycosides), their diversity, natural distribution, biosynthesis, biodegradation, tissue and subcellular localizations; emphasis on their proposed biochemical and ecological roles in plant metabolism. Prerequisite: 4:121 or 99:110 or 99:120 or consent of instructor.

2:128 Fundamental Genetics **3-4 s.h.**
Nature and function of genetic mechanism; classical, molecular, developmental, population, and evolutionary aspects. Prerequisites: 37:3 and 4:14. Same as 37:128.

2:129 Fundamental Genetics Laboratory **1-3 s.h.**
Experiments with Drosophila and bacteriophages to illustrate major genetic principles. Offered spring semesters. Same as 37:129.

2:130 Fundamental Genetics Laboratory: Molecular Genetics of Yeast **3 s.h.**
Same as 37:130.

2:131 Evolution **4 s.h.**
Evolutionary mechanisms; nature and sources of genetic variation; natural selection; origin and maintenance of adaptation; reproductive isolation and the origin of species; evolution of higher taxa. Prerequisite: 2:128. Same as 37:131.

2:137 Medical Mycology **4 s.h.**
Basic techniques in the study of fungi that are pathogenic to man. Consent of instructor required. Same as 61:169.

2:140 Systematics **2-3 s.h.**
The nature of species, isolating mechanisms, hybridization; problems of convergence, homology; plant mating systems; types of information used in making taxonomic decisions. Prerequisite: 2:1 or 37:3 or equivalent.

2:150 Tutorial Undergraduate Research **1-4 s.h.**
Individual undergraduate laboratory and/or field research conducted under the guidance of a faculty member; includes development of a written research proposal and a final written research report.

2:151 Summer Flora **2-3 s.h.**
Field and laboratory study of native and cultivated ferns, conifers, and flowering plants found in Iowa; identification, recognition, and evolutionary relationships among plant families; individual field collections (for 3 s.h.).

2:153 Special Topics **arr.**
Topics in plant science determined by student interest; botany in relation to other fields of study. Consent of instructor required.

2:156 Scanning Electron Microscopy and X-ray Microanalysis **3 s.h.**
Theory, operation, and application of scanning electron microscopy and X-ray microanalysis for advanced students, staff, and investigators. Same as 12:156, 52:156.

2:160 Genetics and Biogenesis of Cell Organelles **arr.**
Genetics and function of cell organelles such as, chloroplasts and mitochondria; interaction between nuclear and organelle genomes. Prerequisites: one course each in genetics and biochemistry.

2:161 Plant Molecular Biology **3 s.h.**
Current research in plant molecular and cellular biology; topics include genome structure, regulation of gene expression, molecular basis of development, and plant-microbial interaction. Prerequisite: 2:128 or 37:128 or 99:110 or equivalent or consent of instructor. Same as 37:161.

2:164 Seminar in Plant Molecular Biology 1-2 s.h.
Seminars, readings, and discussions on recent progress in plant cellular and molecular biology. Prerequisite: 2:128 or 37:128 or consent of instructor. Same as 37:164.

2:170 Eukaryotic Molecular Biology 2-3 s.h.
Same as 37:170.

2:196 Honors Laboratory Research 1-3 s.h.

2:197 Honors Readings in Botany 1-3 s.h.

Primarily for Graduates

2:214 Seminar: Ecological Writing and Criticism 0-2 s.h.
Same as 37:214.

2:215 Genetics Seminar 0-2 s.h.
Specific topic selected each year. May be repeated. Prerequisite: 2:128 or 37:128 or consent of instructor. Same as 37:215, 61:215, 99:215.

2:218 Electron Microscopy Techniques 3 s.h.
Lecture and laboratory on methods of tissue fixation, embedding, ultrathin sectioning and staining; theory, use, maintenance of electron microscope; associated photographic techniques; class project. Consent of instructor required. Prerequisite: a course in cell biology. Same as 37:218, 61:218.

2:220 Advanced Electron Microscopy arr.
Same as 61:220.

2:221 Seminar: Botany 0-1 s.h.

2:225 Research: Botany arr.

2:229 Thesis: Botany arr.

2:230 Fundamentals of Tropical Biology: An Ecological Approach 8 s.h.
Same as 37:230.

2:237 Current Topics in Evolution 1-2 s.h.
Same as 37:237.

CHEMISTRY

Chair: Donald J. Pietrzyk
Professors: Susan B. Allen, Norman C. Baenziger, Edward B. Buchanan, Jr., Donald J. Burton, E. David Cater, Robert E. Coffman, Leodis Davis, John R. Doyle, H. Bruce Friedrich, Harold M. Goff, Vasu Nair, Ronald T. Pflaum, Donald J. Pietrzyk, Kenneth M. Sando, William C. Stwalley, Dwight C. Tardy, David F. Wiemer
Professor emeritus: Robert E. Buckles
Associate professors: Mark A. Arnold, William E. Bennett, Darrell P. Eyman, James B. Gloer, Richard F. Jordan, Louis Messerle, Daniel M. Quinn
Assistant professors: Vicki H. Grassian, William J. Scott, Gary W. Small
Undergraduate degrees offered: B.A., B.S. in Chemistry
Graduate degrees offered: M.S., Ph.D. in Chemistry

Undergraduate Programs

Bachelor of Science

Present and projected demand for chemists with a B.S. degree is excellent in research and in control and process-development work. The B.S. program also provides all the prerequisites for graduate work in chemistry or biochemistry. These are the major requirements for the B.S. degree.

4:13-14 Principles of Chemistry I-II	6 s.h.
4:16 Principles of Chemistry Lab I	2 s.h.
4:17 Basic Measurements	2 s.h.
4:111-112 Analytical Chemistry I-II	6 s.h.
4:121-122 Organic Chemistry I-II	6 s.h.
4:125 Inorganic Chemistry	2 s.h.
4:131-132 Physical Chemistry I-II	6 s.h.
4:141 Organic Chemistry Laboratory	3 s.h.
4:143 Analytical Measurements	3 s.h.
4:144 Physical Measurements	3 s.h.
4:153 Inorganic Chemistry Laboratory	3 s.h.
4:170 Advanced Inorganic Chemistry	3 s.h.
Integral calculus (22M:35-36 Engineering Calculus I-II or 22M:25-26 Calculus I-II)	8 s.h.
Introductory physics (29:17-18 Introductory Physics I-II recommended, 29:11-12 College Physics accepted)	8 s.h.

Credit earned in advanced science elective courses plus credit earned in 4:162 Undergraduate Research must total at least 6 semester hours. Advanced science electives may be chosen in the areas of chemistry, mathematics, computer science, astronomy, physics, engineering, radiation biology, biochemistry, microbiology, pharmacology, pharmacy, botany, biology, geology, or physiology. The department requires 67 semester hours for the Bachelor of Science degree, 45 of which must be in chemistry courses.

Bachelor of Arts

The B.A. curriculum in chemistry provides a general education with some concentration in fundamental chemistry, but with a wider choice of electives than the B.S. curriculum includes. Students electing this program may qualify for high school teaching, provided they meet teaching certification requirements. By selecting appropriate electives, students can meet entrance requirements for medicine, dentistry, or other professional programs while satisfying the B.A. requirements in chemistry. These are the major requirements for the B.A. degree.

4:13-14 Principles of Chemistry I-II	6 s.h.
4:16 Principles of Chemistry Lab I	2 s.h.
4:17 Basic Measurements	2 s.h.
4:111-112 Analytical Chemistry I-II	6 s.h.
4:121-122 Organic Chemistry I-II	6 s.h.
4:125 Inorganic Chemistry	2 s.h.
4:131-132 Physical Chemistry I-II	6 s.h.
4:141 Organic Chemistry Laboratory	3 s.h.
4:143 Analytical Measurements	3 s.h.
or	
4:144 Physical Measurements	3 s.h.
Integral calculus (22M:35-36 Engineering Calculus I-II or 22M:25-26 Calculus I-II)	8 s.h.
Introductory physics (29:17-18 Introductory Physics I-II recommended, 29:11-12 College Physics accepted)	8 s.h.

Advanced courses in chemistry, biology, mathematics, physics, or other scientific areas are recommended. The department requires 52 semester hours for the Bachelor of Arts degree, 36 of which must be in chemistry courses.

Minor

The minimum requirements for a minor in chemistry are 15 semester hours, including three semester hours in introductory level courses and 12 semester hours taken at The University of Iowa in advanced chemistry courses numbered 100 and above. *Note: 4:13-14 Principles of Chemistry I-II and 4:16 Principles of Chemistry Lab are prerequisites for upper-level courses in chemistry.*

Honors Program

To graduate with honors in chemistry, a student must be enrolled in the College of Liberal Arts Honors Program, enroll in 4:162 Undergraduate Research, complete a research project acceptable to the student's research adviser, and write an honors thesis based upon that research. Students are encouraged, but not required, to present their research at local and regional meetings and to publish their results in professional journals.

Teacher Certification

The chemistry courses required for the B.S. or B.A. degrees satisfy the major requirements for teaching in secondary schools. A minor in chemistry satisfies the requirements for a teaching emphasis in chemistry (see "Science Education" in the "College of Liberal Arts" section of the *Catalog*).

Graduate Programs

Master of Science

The department offers the M.S. degree, with or without thesis, in analytical, inorganic, organic, and physical chemistry and in chemical physics. Candidates for the M.S. must demonstrate minimal proficiency in analytical, inorganic, organic, and physical chemistry by passing specific examinations or by enrolling in suitable core courses. This requirement must be completed by the end of the second year of enrollment. At least 30 semester hours of graduate work are required for the master's degree. A minimum grade-point average of 2.50 is required for admission to the master's examination.

Doctor of Philosophy

A program of study for the Ph.D. degree in the areas listed for the M.S. degree includes the minimal proficiency examinations, core courses as may be necessary, a minimum of 11 semester hours of advanced course work, and research.

Students who have met the course requirements with a cumulative grade-point average of 3.00 are admitted to the oral comprehensive examination upon presentation and preliminary approval of their written research proposal; they must take the oral comprehensive examination

no later than the end of their second year of enrollment.

Upon completing the Ph.D. research, the student prepares the dissertation. The final examination consists of an oral defense of the thesis, at which time at least one manuscript of the publishable portion of the thesis is presented.

Interdisciplinary Programs

The Department of Chemistry cooperates on interdisciplinary programs in applied mathematical sciences and in chemical physics (see the "Graduate College" section of the *Catalog*). Students with undergraduate degrees in chemistry, physics, mathematics, or engineering are eligible.

Admission

Applicants for graduate admission should have a bachelor's degree in chemistry with a recommended grade-point average above 3.00. Most admitted graduate students receive financial support, and application forms may be obtained by writing to the Department of Chemistry.

Facilities

The department is housed in a five-story building containing two auditoriums, five lecture rooms, fifteen undergraduate laboratories, forty-three graduate research laboratories, a computer laboratory, and a number of special-purpose instruction rooms. Modern scientific equipment is available for research.

The department's excellent library facilities are available to all students. The library contains standard reference works and complete volumes of chemistry and chemical engineering journals and subscribes to a large number of current scientific journals.

Courses

Primarily for Undergraduates

Students planning to take more than one year of chemistry should take 4:13, 4:14, and 4:16. Students who require only one year of chemistry may take 4:7, 4:8, and 4:16.

4:000 Cooperative Education Internship **0 s.h.**

4:5 Technology and Society **3-4 s.h.**
Nonmathematical exploration of selected areas of technology; basic science background, current technological applications, implications for society; intended for nonscience majors. GER: natural sciences. Offered for 4 s.h. with laboratory, 3 s.h. without. Students with previous college-level course work in chemistry may not enroll for credit.

4:7 General Chemistry I **3 s.h.**
Atomic structure, chemical bonds, mole relations, stoichiometry, states of matter, acids and bases, reaction rates, electrochemistry, and nuclear chemistry. For students with no high school chemistry or for those who do not plan to take more than one year of chemistry. GER: natural sciences. Knowledge of elementary algebra required.

4:8 General Chemistry II **3 s.h.**
Introduction to organic chemistry and biochemistry for students who do not plan to take more advanced courses in chemistry. GER: natural sciences. Prerequisite: 4:7 or high school chemistry.

4:13 Principles of Chemistry I **3 s.h.**
Introduction to basic principles of chemical bonding and chemical reactions; atomic and molecular structure, chemical equations, stoichiometry, gases, liquids, solids, thermodynamics of phase changes, solutions, colligative properties, equilibrium, acids, bases, pH. GER: natural sciences. Prerequisite: 22M:2 or ACT math subscore of 24 or a score of 20 on the basic math proficiency exam.

4:14 Principles of Chemistry II **3 s.h.**
Continuation of 4:13; chemical thermodynamics, electrochemistry, chemical kinetics, chemical bonding, systematic descriptive chemistry of the nonmetals and metals, nuclear chemistry. GER: natural sciences. Prerequisite: 4:13 or 4:7.

4:16 Principles of Chemistry Lab I **2 s.h.**
Introduction to laboratory techniques for students taking 4:14. GER: natural sciences. Prerequisite: 4:13.

4:17 Basic Measurements **2 s.h.**
Continuation of 4:16; introduction to techniques of data collection and processing, including titrimetric and instrumental techniques for data collection and computer techniques for data processing. Open only to chemistry majors. Prerequisite: 4:16.

4:101 Elementary Quantitative Analysis **4 s.h.**
Principles of quantitative analytical chemistry; titrimetric and spectrophotometric methods of analysis; two lectures and two laboratory sessions weekly. Prerequisites: 4:14 and 4:16.

4:111 Analytical Chemistry I **3 s.h.**
Theory and practice of modern analytical chemistry; emphasis on chemical equilibria (acid-base chemistry, solubility, complexation) and electroanalytical chemistry (potentiometry, voltammetry, coulometry). Pre- or corequisite: 4:131.

4:112 Analytical Chemistry II **3 s.h.**
Continuation of 4:111, which is prerequisite; emphasis on instrumental methods, including atomic and molecular spectroscopy, mass spectrometry, and chemical separations. Prerequisite: 4:111.

4:121 Organic Chemistry I **3 s.h.**
General principles of the chemistry of carbon-containing compounds, including structure, stereochemistry, physical properties, reactivity, reaction mechanisms, and synthesis; emphasis is on the chemistry of alkanes, alkenes, alkynes, alcohols, alkyl halides, and aromatics. Prerequisite: 4:14 or 4:8.

4:122 Organic Chemistry II **3 s.h.**
Continuation of 4:121, which is prerequisite; topics include use of spectroscopic techniques to determine chemical structures, and the chemistry of carbonyl compounds, amines, ethers, amino acids, carbohydrates, and nucleosides. Prerequisite: 4:121.

4:125 Inorganic Chemistry **2 s.h.**
Introduction to principles of modern inorganic chemistry; emphasis on descriptive chemistry of the main group and transition elements, ionic and covalent chemical bonding theories, symmetry, and inorganic stereochemistry. Prerequisite: 4:14. Corequisite: 4:122.

4:127 Introduction to Polymer Chemistry **4 s.h.**
Basic principles of the methods, mechanisms, and kinetics of polymerization reactions and their relationship to the structure and physical properties of polymers; laboratory experiments to illustrate synthesis, identification, and analysis of polymers. Prerequisites: 4:17, 4:122, 4:131, and 4:141.

4:130 Physical Chemistry for the Life Sciences **3 s.h.**
Principles and applications of thermodynamics; transport phenomena: diffusion, sedimentation and the ultracentrifuge, membrane potentials; characterization of large molecules; elements of information theory and elementary computer graphics. Prerequisites: 4:122 and one semester of calculus.

4:131 Physical Chemistry I **3 s.h.**
Chemical thermodynamics and its application to chemical equilibrium, phase equilibria, and electrochemistry; ideal and real gases; kinetic theory; chemical kinetics. Offered fall semesters. Prerequisites: 4:14, 29:12 or 29:18, and 22M:26 or 22M:36.

4:132 Physical Chemistry II **3 s.h.**
Introduction to quantum mechanics and its application to atomic and molecular structure; determination of structure by various spectroscopic methods; solids and liquids; diffraction methods for determination of crystal structures; statistical thermodynamics; chemical kinetics. Offered spring semesters. Prerequisites: 29:12 or 29:18, and 22M:26 or 22M:36. Recommended: 4:131.

4:135 Physical Chemistry Laboratory **2 s.h.**
Laboratory experiments to illustrate the principles of modern physical chemistry; lecture and two laboratories per week for ten weeks. Open only to chemical engineering majors. Prerequisites: 4:131 and some knowledge of computer programming. Corequisite: 4:132.

4:141 Organic Chemistry Laboratory **3 s.h.**
Preparation, purification, identification, and analysis of chemical compounds, principally organic compounds. Prerequisites: 4:121 and 4:16. Corequisite: 4:122.

4:143 Analytical Measurements **3 s.h.**
Theory and practice of modern analytical laboratory methods; emphasis on experimental techniques and data analysis in spectroscopy, chromatography, and electrochemistry. Prerequisites: 4:17 and 4:111. Pre- or corequisite: 4:112.

4:144 Physical Measurements **3 s.h.**
Laboratory experiments illustrating the principles of modern physical chemistry; lecture and two laboratories per week. Open only to chemistry majors. Prerequisites: 4:17, 4:131, and some knowledge of computer programming. Corequisite: 4:132.

4:153 Inorganic Chemistry Laboratory **3 s.h.**
Preparation and characterization of a variety of inorganic, organometallic, and coordination compounds of the main group and transition elements; emphasis on synthetic techniques and methods for characterization of inorganic species. Prerequisites: 4:141 and 4:125.

4:162 Undergraduate Research **1-4 s.h.**
May be repeated. Consent of chemistry major adviser required.

4:170 Advanced Inorganic Chemistry **3 s.h.**
Further development of the principles of modern inorganic chemistry, including crystal field/ligand field/molecular orbital theory, inorganic reaction mechanisms, coordination chemistry, bioinorganic chemistry, main group and transition metal organometallic chemistry, and solid-state inorganic chemistry. Prerequisites: 4:125 and 4:132.

4:171 Advanced Analytical Chemistry **3 s.h.**
Survey of analytical chemistry; emphasis on fundamental aspects of electrochemistry, atomic and molecular spectroscopy, and chemical separations. Prerequisites: 4:112 and 4:132.

4:172 Advanced Organic Chemistry **3 s.h.**
Basic concepts of organic chemistry from the viewpoints of structure, mechanism, synthesis, and stereochemistry. Prerequisite: 4:122.

4:173 Advanced Physical Chemistry **3 s.h.**
Physical chemistry for advanced students. Prerequisite: 4:132.

4:180 Introduction to Lasers and Applications **1-3 s.h.**
Generation, propagation, and detection of laser light; basics of laser spectroscopy, photochemistry, and laser heating; discussion of current research. Prerequisite: 4:173 or consent of instructor.

4:191 Chemical Pedagogy **0-1 s.h.**
Technique and practice of presenting chemical principles and principles of self-learning to students. Prerequisite: senior standing.

4:201 Special Topics in Inorganic Chemistry **3 s.h.**
Intensive study of selected areas of specialization within inorganic chemistry; topics change annually. May be repeated. Prerequisite: 4:170.

4:202 Coordination Compounds **3 s.h.**
Formation, reactions, physical properties, and structures of molecules formed by combinations of donor molecules with acceptor elements. Prerequisite: 4:170.

4:203 Organometallic Chemistry **3 s.h.**
General survey of organometallic chemistry; emphasis on the organometallic compounds of the transition metal elements. Prerequisite: 4:170.

4:204 Physical Methods in Inorganic Chemistry **3 s.h.**
Application of physical methods to problems in inorganic

chemistry; emphasis on recent developments. Prerequisite: 4:170.

4:210 Chemical Sensors **1 s.h.**
Theory, practical limitations, and analytical utility of chemical sensors based on immobilized reagents with electrochemical, thermal, and optical transduction mechanisms. Prerequisites: 4:111 and 4:112, or 4:171.

4:211 Chemometrics **1 s.h.**
Introduction to mathematical and statistical methods used in the analysis of experimental data; emphasis on calibration, signal processing, numerical optimization, and experimental design. Prerequisites: 4:111 and 4:112, or 4:171.

4:212 Mass Spectrometry **1 s.h.**
Theory and practice of methods and instrumentation used in modern analytical mass spectrometry; emphasis on hardware components such as ionization sources, sample delivery mechanisms, mass analyzers, and instrumental interfaces. Prerequisites: 4:111 and 4:112, or 4:171.

4:213 Voltammetry **1 s.h.**
Relationships between time, current, voltage, and chemical concentration as measured with electrochemical apparatus; theoretical and practical applications of such measurements. Prerequisites: 4:111 and 4:112, or 4:171.

4:214 Molecular Spectroscopy **1 s.h.**
Principles of molecular absorption and emission spectroscopy in the ultraviolet, visible, and infrared regions of the spectrum, including fluorescence, phosphorescence, and Raman spectroscopy; applications to analytical problems, with emphasis on modern instrumentation and methodology. Prerequisites: 4:111 and 4:112, or 4:171.

4:215 Atomic Spectroscopy **1 s.h.**
Principles of atomic absorption and emission spectroscopy; applications to analytical problems, with emphasis on modern instrumentation and methodology. Prerequisites: 4:111 and 4:112, or 4:171.

4:216 Gas Chromatography **1 s.h.**
Fundamentals of gas chromatography including partition, absorption, instrumentation, and detection. Prerequisites: 4:111 and 4:112, or 4:171.

4:217 Liquid Chromatography **1 s.h.**
Fundamentals of liquid chromatography including partition, absorption, instrumentation, and detection. Prerequisites: 4:111 and 4:112, or 4:171.

4:218 Fourier Transform Techniques **1 s.h.**
Application of the Fourier transform to analytical chemistry; emphasis on signal processing, spectroscopic, and electrochemical methods. Prerequisites: 4:111 and 4:112, or 4:171.

4:219 Electronics **1 s.h.**
Analog and digital domains in the application of electronics to techniques in chemical measurements. Prerequisites: 4:111 and 4:112, or 4:171.

4:221 Introduction to Organic Research **3-4 s.h.**
Synthesis and purification of organic compounds; methods and techniques of structure determination. Prerequisite: 4:132.

4:222 Interpretation of Spectra **3 s.h.**
Interpretation of electronic, vibrational and magnetic resonance, and mass spectra of complex molecules. Prerequisites: 4:132 and 4:172.

4:223 Special Topics in Organic Chemistry **3 s.h.**
Topics change annually. Prerequisite: 4:172.

4:224 Physical Organic Chemistry **3 s.h.**
Fundamental physico-chemical concepts of molecular structure, stereoisomerism, equilibria, and reaction rates applied to organic compounds. Prerequisites: 4:132 and 4:172.

4:228 Mechanisms of Organic Reactions **3 s.h.**
Application of basic mechanistic concepts to organic reactions. Prerequisite: 4:224.

4:229 Advanced Organic Preparations **3 s.h.**
Discussion of preparation of complex organic compounds. Prerequisite: 4:172.

4:231 Statistical Thermodynamics I **3 s.h.**
Fundamental principles of statistical thermodynamics and elementary chemical kinetics. Prerequisite: 4:132.

4:233 Quantum Chemistry I **3 s.h.**
Quantum mechanics of chemical systems; time-independent and time-dependent perturbation theory; variational theory; Hartree-Fock theory; atomic structure and spectra. Prerequisite: 4:173.

4:234 Quantum Chemistry II **3 s.h.**
Continuation of 4:233, which is prerequisite; group theory; molecular orbital and valence bond theories and the Roothaan procedure; electronic, vibrational, rotational, and spin resonance spectroscopies; quantum statistics; current topics. Prerequisite: 4:233.

4:235 Chemical Kinetics **3 s.h.**
Survey of experimental and theoretical aspects of the dynamics of chemical reactions from the phenomenological point of view. Prerequisite: 4:132.

4:236 Reaction Dynamics **3 s.h.**
Investigation of chemical and physical rate processes from the microscopic point of view; topics include collision dynamics, potential energy surfaces, energy disposal, and energy transfer. Prerequisite: 4:231.

4:242 Physical Chemistry Topics **1-3 s.h.**
An alternate topic in physical chemistry is covered each year the course is offered. May be repeated. Prerequisite: 4:132.

4:243 Diffraction Analysis **2-3 s.h.**
Theory and methods of diffraction of electrons, neutrons, and X-rays by gases, liquids, and solids; structure determination and computational methods. Consent of instructor required.

4:281 Seminar: Analytical Chemistry **0-1 s.h.**
Consent of instructor required.

4:283 Seminar: Inorganic Chemistry **0-1 s.h.**
Consent of instructor required.

4:285 Seminar: Organic Chemistry **0-1 s.h.**
Consent of instructor required.

4:286 Seminar: Physical Chemistry **0-1 s.h.**
Consent of instructor required.

4:290 Research in Chemistry **arr.**
Thesis work for advanced degrees; conference and laboratory work arranged. Consent of department head and major adviser required.

4:291 Research Seminar **0-1 s.h.**
Presentation and discussion of thesis research work required for advanced degrees.

CLASSICS

Chair: Erling B. Holtsmark
Professors: Jonathan A. Goldstein, Erling B. Holtsmark, Roger A. Hornsby, Hunter Rawlings III
Professors emeriti: Margaret A. Alexander, Oscar E. Nybakken
Associate professors: Helena R. Dettmer, John F. Finamore, Donald F. Jackson
Assistant professors: Mary J. Depew, Robert C. Ketterer
Adjunct assistant professor: Marcia H. Lindgren
Undergraduate degrees offered: B.A. in Ancient Civilization, Classics, Greek, Latin
Graduate degrees offered: M.A. in Classics, Greek, Latin; Ph.D. in Classics

Classics is the study of ancient languages, literatures, and cultures of the Mediterranean basin from approximately 2000 B.C. to 454 A.D. It embraces three civilizations—the Minoan-Mycenaean, Greek, and Roman; two languages—Greek and Latin; and a geographical area including Europe, North Africa, Egypt, and the Near East. The Department of Classics strives to help students understand and interpret the contribution of the ancient world to life in the present and the future.

Undergraduate Program

A Bachelor of Arts in classics provides a solid foundation for graduate work in law, history, art, philosophy, religion, and classics. Recent graduates have become secondary school and university teachers, lawyers, doctors, librarians, museum curators, and bankers.

Major in Greek

Graduates with a major in Greek know how to read the ancient Greek language, are acquainted with the major works of Greek literature, and have knowledge of the history of ancient Greece and the Near East of the seventh through the fifth centuries B.C., when most of the modern Western notions of political, artistic, and social life began.

For a B.A. degree with a major in Greek, students must earn a minimum of 30 semester hours of major credit, of which 24 semester hours must be in Greek language courses. The following courses, or their equivalents, are required.

14:1-2 Elementary Greek	8 s.h.
14:11-12 Second-Year Greek I-II	6 s.h.
14:121-122 Homer and Hesiod, and Herodotus	6 s.h.
14:161 Greece and Persia	3 s.h.
14:162 Fifth-Century Athens	3 s.h.
14:171 Elementary Greek Composition	3 s.h.

Major in Latin

Graduates with a major in Latin know how to read Latin; they also have an understanding of some aspects of the Roman republic and empire when Rome established its hegemony over the Mediterranean basin, laid the foundation of law for the Western world, and transmitted the culture of Greece to the West.

Candidates for the B.A. degree with a major in Latin must earn a minimum of 30 semester hours of major credit, at least 24 of which must be in Latin language courses. The following courses, or their equivalents, are required.

20:1-2 Elementary Latin	8 s.h.
or	
20:15 Accelerated Latin	4 s.h.
or	
20:117 Accelerated Elementary Latin (summer session)	4 s.h.
20:16-17 Second-Year Latin I-II	6 s.h.
20:81 Age of Cicero	3 s.h.
20:82 Age of Augustus	3 s.h.
20:171 Elementary Latin Composition	3 s.h.
Two additional Latin language courses numbered 100 or above	6 s.h.

See the "College of Education" section of the *Catalog* for information on teacher certification in Latin.

Major in Classics (Greek and Latin)

The B.A. degree with a major in classics requires a minimum of 36 semester hours of major credit, 30 of which must be in Greek and Latin language courses. The

following courses, or their equivalents, are required.

14:1-2 Elementary Greek	8 s.h.
14:11-12 Second-Year Greek I-II	6 s.h.
20:1-2 Elementary Latin	8 s.h.
20:16-17 Second-Year Latin I-II	6 s.h.
14:121-122 Homer and Hesiod, and Herodotus	6 s.h.
or	
20:81 Age of Cicero	3 s.h.
and	
20:82 Age of Augustus	3 s.h.
14:171 Elementary Greek Composition	3 s.h.
or	
20:171 Elementary Latin Composition	3 s.h.

Major in Ancient Civilization

This major is sponsored by the Schools of Art and Art History and Religion and the Departments of Classics and History.

The major concentrates on the ancient civilization of the Mediterranean world and draws on courses offered by various departments of the University. It is not primarily a preparation for a graduate degree program; nevertheless, it provides a sound basis for preparing teachers at the secondary and junior college levels. In addition to the normal college requirements for the B.A. degree, the following are the specific requirements of the major.

Ancient art	6 s.h.
Ancient history	6 s.h.
Ancient philosophy or religion	6 s.h.
Classics (either "Classics in English" courses, or Latin or Greek language courses)	6 s.h.
Appropriate courses in art, history, philosophy, religion, or linguistics	3 s.h.
14:194 Seminar in Ancient Civilization	3 s.h.

Honors

For exceptional seniors who attain a 3.50 grade-point average in their first three years of classics courses, two courses are offered in honors reading, one each semester of the senior year, for 3 semester hours of credit each. The readings and discussions are on an ancient author or a field in ancient history or literature chosen by students and the instructor. During the first semester students present an essay every other week; at the end of the second semester they present a long paper, which is examined by at least three members of the department.

Minors

A minor requires a minimum of 15 semester hours in classics courses with a minimum grade-point average of 2.00. Of the 15 semester hours, at least 12 must be in advanced courses taken at The University of Iowa. Students may earn a minor from the department in four areas: Greek, Latin, classics, and ancient civilization. The following courses are considered advanced for the minor.

Greek

14:11-12 Second-Year Greek I-II	6 s.h.
All courses numbered 14:121 or higher	

Courses numbered 14:100-120 do not count toward the minor because they are not courses in Greek language.

Latin

20:16-17 Second-Year Latin I-II	6 s.h.
20:81 Age of Cicero	3 s.h.
20:82 Age of Augustus	3 s.h.
All courses numbered 20:121 or higher	

Courses numbered 20:100-120 do not count toward the minor because they are not courses in Latin language.

Classics

14:11-12 Second-Year Greek I-II	6 s.h.
20:16-17 Second-Year Latin I-II	6 s.h.
20:81 Age of Cicero	3 s.h.
20:82 Age of Augustus	3 s.h.

These courses or their equivalents are required for the minor in classics, so that students will have had both Greek and Latin.

Ancient Civilization

All courses numbered 14:100, 20:100, or higher; appropriate courses from the schools of Art and Art History and Religion and the departments of History and Philosophy, as selected by the interdepartmental committee on the major in ancient civilization.

14:26 Introduction to Ancient Art	3 s.h.
20:81 Age of Cicero	3 s.h.
20:82 Age of Augustus	3 s.h.

Language for Nonmajors

Students who want to satisfy the College of Liberal Arts foreign language requirement for the B.A. degree by studying Greek should take 14:1-2 Elementary Greek and 14:11-12 Second-Year Greek I-II. Students who want to meet the requirement by studying Latin may elect 20:1-2 Elementary Latin or 20:15 Accelerated Latin, and 20:16-17 Second-Year Latin I-II.

Graduate Programs

For the general requirements of the Graduate College, including the comprehensive examinations, see the "Graduate College" section of the *Catalog*.

Graduate students in classics may not include in their programs more than 6 semester hours of courses numbered 101-199.

Master of Arts

The department offers the M.A. degree in Latin, Greek, or classics. Candidates must earn a minimum of 30 semester hours of major credit in courses numbered 101 and above. Usually, students in the Latin program who have not had Greek are expected to include at least elementary Greek in their programs.

Doctor of Philosophy

Required Courses

A one-semester course in Greek rapid readings (3 s.h.)
A one-semester course in Latin rapid readings (3 s.h.)
Advanced Greek composition (3 s.h.) or equivalent
Advanced Latin composition (3 s.h.) or equivalent
Survey of Ancient Near East and Greece (3 s.h.)
The Hellenistic World and Rome (3 s.h.)

Any two of the following three courses:
Comparative Greek and Latin (3 s.h.)
Greek Palaeography (3 s.h.)
Any 3 s.h. graduate-level art course

The minimum Graduate College requirement is 72 semester hours; the difference is to be made up from regular departmental offerings.

Required Ph.D. Examinations

Precomprehensives

French competence
German competence
Latin sight (3 s.h.)
Greek sight (3 s.h.)

One sight exam must be attempted by the end of the first year of graduate study.

Ph.D. Comprehensives

Request for the comprehensive examination must be filed at least three weeks before the date of the examination. Candidates have the option of taking examinations in any sequence.

Greek literature (including passages)—4 hours, written

Latin literature (including passages)—4 hours, written

Special field or author (Greek)—3 hours, written

Special field or author (Latin)—3 hours, written

Dissertation

Facilities

Extensive collections of classical texts and periodicals in the Main Library and the Art and Art History Library facilitate research in the major areas of Greek and Roman civilization.

The department has a varied collection of slides on classical subjects, and a small library.

Associated with the department, the classical museum contains a valuable collection of coins, vases, and facsimiles in

bronze from Mycenae, Pompeii, and Herculaneum.

The University is a supporting institution of the American School of Classical Studies at Athens, the American Academy in Rome, and the Vergilian Society, thereby making those facilities available to its faculty and graduates.

Courses

Greek—for Undergraduates

14:1 Elementary Greek 4 s.h.
Fundamentals of Attic Greek and basic concepts of Greek civilization. GER: foreign language.

14:2 Elementary Greek 4 s.h.
Continuation of 14:1, which is prerequisite; selections from Greek authors. GER: foreign language. Does not fulfill College of Liberal Arts foreign language requirement.

14:11 Second-Year Greek I 3 s.h.
Reading of selected texts of Greek prose and poetry. GER: foreign language. Prerequisite: 14:2 or equivalent.

14:12 Second-Year Greek II 3 s.h.
Continuation of 14:11, which is prerequisite. GER: foreign language.

Greek—for Undergraduates and Graduates

14:121 Homer and Hesiod 3 s.h.
Selections from Homer's *Iliad* and *Odyssey* and from Hesiod's *Works and Days* and *Theogony* read in Greek; complete works read in English. For third-year Greek students.

14:122 Herodotus 3 s.h.
Continuation of 14:121, which is prerequisite.

14:161 Greece and Persia 3 s.h.
Events leading to the Persian War, course of the war, and its immediate aftermath; Aeschylus's *Persae* and selections from Herodotus read in Greek; supplementary readings in English. For fourth-year Greek students.

14:162 Fifth-Century Athens 3 s.h.
Continuation of 14:161, which is prerequisite; changing intellectual climate of late fifth-century Athens and breakdown of Athenian democracy; selections from Thucydides, Sophocles' *Philoctetes*, Euripides' *Suppliants*, and Herodotus read in Greek; supplementary readings in English.

14:171 Elementary Greek Composition 3 s.h.
Review of morphology and syntax and Greek sentence structure; composition of short passages in Greek.

14:199 Private Assignments 1-3 s.h.
Supervised individual study. For advanced students who are not classics majors. May be repeated.

Greek—for Graduates

14:202 Advanced Reading arr.
Open only to classics graduate students.

14:204 Rapid Readings in Greek 3 s.h.

14:206 Greek Palaeography 3 s.h.
Study of Greek papyri, manuscripts, early printed texts, stemmatics, and textual criticism.

14:210 Seminar Problems in Ancient Art 3 s.h.
Same as 1H:226.

14:227 Homer 3 s.h.

14:231 Euripides 3 s.h.
Critical reading of selected plays of Euripides.

14:234 Aristophanes 3 s.h.
Critical reading of selected plays of Aristophanes.

14:236 Plato's Philosophy 3 s.h.

14:238 Aristotle 3 s.h.
Aristotle's theory of the soul; reading of Aristotle's *De Anima* in English and books 2 and 3 in Greek.

14:240 Attic Orators 3 s.h.
Study of Greek oratory and critical reading of selected texts.

14:241 Herodotus 3 s.h.
Reading and critical study emphasizing Herodotus's intellectual background and the aims of his history.

14:242 Thucydides 3 s.h.

14:249 Greek Historians 3 s.h.

14:261 History of Criticism from Plato to 1700 3 s.h.
Theories of literary criticism, including the writings of Plato, Aristotle, Horace, Longinus, Demetrius, Plotinus, Porphyry, Augustine, Averroes, Spenser, Sidney, and Dryden. Same as 48:261, 49:417, 8:261.

14:265 Hellenistic Poetry 3 s.h.

14:272 Advanced Greek Composition 3 s.h.
3 s.h.

14:280 Greek Novel 3 s.h.
Readings in Chariton, Xenophon of Ephesus, Longus, Achilles Tatius, and Heliodorus, and epitomes in the *Bibliotheca* of the Patriarch Photius.

14:291 Greek Thesis arr.
For Ph.D. candidates writing the dissertation.

Latin—for Undergraduates

20:000 Cooperative Education Internship 0 s.h.

20:1 Elementary Latin 4 s.h.
Introductory study of Latin morphology and syntax; readings in Latin. GER: foreign language.

20:2 Elementary Latin 4 s.h.
Continuation of 20:1, which is prerequisite. GER: foreign language.

20:3 Latin for Beginners 4 s.h.
English grammar as a basis for Latin; for students who have had no previous training in foreign languages or who have difficulty learning a foreign language. GER: foreign language.

20:4 Latin for Beginners 4 s.h.
Continuation of 20:3; prepares students to continue the sequence of 20:16-17. GER: foreign language.

20:15 Accelerated Latin 4 s.h.
General review for students who have had some high school Latin. GER: Foreign Language. Not open to students who have passed 20:1 or 20:2.

20:16 Second-Year Latin I 3 s.h.
Reading of Latin prose and poetry. GER: foreign language. Prerequisite: 20:2 or 20:15 or two years of high school Latin.

20:17 Second-Year Latin II 3 s.h.
GER: foreign language. Prerequisite: 20:16 or equivalent.

20:81 Age of Cicero 3 s.h.
Cultural and social life of Rome in the last century of the republic; reading in Latin of selected authors such as Cicero, Sallust, and Catullus; supplementary readings in English. Prerequisite: 20:17 or equivalent.

20:82 Age of Augustus 3 s.h.
Life in Rome in the first century of the empire; readings in Latin of Suetonius, Horace, Vergil, and *Res Gestae*; supplementary readings in English. Prerequisite: 20:81 or equivalent.

Latin—for Undergraduates and Graduates

20:117 Accelerated Elementary Latin 4 s.h.
Rapid review of elements of Latin. GER: foreign language. May not be taken by students who have completed 20:1, 20:2, or courses numbered 20:15 and above. Offered summer sessions.

20:122 Latin Drama 3 s.h.

20:124 Lucretius 3 s.h.

20:130 Latin Lyric Poetry 3 s.h.
Reading and criticism of selected Latin poems from writings of Catullus, Horace, Vergil, and later Latin poets. Prerequisite: 20:17 or equivalent.

20:134 Ovid 3 s.h.

20:143 Livy 3 s.h.

20:171 Elementary Latin Composition 3 s.h.
Latin sentence structure and composition of Latin essays.

20:185 Medieval Latin 3 s.h.
Reading of authors chosen for content and as representing important types of medieval Latin. May be repeated.

20:187 Advanced Undergraduate Latin I 3 s.h.
Survey of Latin literature from the beginning to the end of the republic.

20:188 Advanced Undergraduate Latin II 3 s.h.
Continuation of 20:187; Latin literature of the empire.

20:191 Honors Readings 3 s.h.
Discussion, readings, and papers on a topic of Roman and Greek civilization.

20:192 Honors Readings 3 s.h.

20:199 Private Assignments 1-3 s.h.
Supervised individual study. For advanced students who are not classics majors. May be repeated.

Latin—for Graduates

20:202 Advanced Reading arr.
Open only to classics graduate students.

20:203 Comparative Greek and Latin 3 s.h.
Systematic comparison of classical Greek and Latin phonology and morphology; comparative material from Germanic and non-Indo-European languages introduced as needed; diachronic approach organized along lines of modern linguistics research.

20:204 Rapid Readings in Latin 3 s.h.

20:226 Roman Philosophy 3 s.h.

20:227 Cicero's Philosophical Works 3 s.h.
Discussion and readings in the *De Officiis, De Natura Deorum, Academica, De Finibus,* and the *Tusculan Disputations* of Cicero.

20:229 Roman Society 3 s.h.
Typology of the Roman kinship system; patterns of succession, marriage, subversion, and magisterial connection.

20:232 Advanced Vergil I 3 s.h.
Includes Vergilian bibliography, *Appendix, Eclogues,* and *Georgics.*

20:233 Advanced Vergil II 3 s.h.
Concentrates on the *Aeneid.*

20:240 Sallust 3 s.h.

20:258 Tacitus 3 s.h.
Reading of historical works of Tacitus to illuminate Roman imperial period.

20:265 Silver Latin 3 s.h.

20:272 Advanced Latin Composition 3 s.h.

20:274 Plautus 3 s.h.

20:275 Catullus 3 s.h.
Reading and literary criticism of the poetry of Catullus; the poet's relation to his Greek antecedents. Prerequisite: ability to read Greek.

20:278 Roman Elegy 3 s.h.

20:279 Latin Humor 3 s.h.

20:291 Latin Thesis arr.
For Ph.D. candidates writing the dissertation.

Classics in English

All readings for these courses are in English; no previous knowledge of Greek or Latin is necessary.

14:13 The Classical Views 3 s.h.
Reading and discussion of the *Iliad,* the *Aeneid,* the *Metamorphoses* of Apuleius, and some other work to introduce the student to the ancient classical view of the human condition. GER: foreign civilization and culture, humanities.

14:26 Introduction to Ancient Art 3 s.h.
Art and architecture of Mediterranean civilization from Minoan times to the age of Constantine. Consent of instructor required. Same as 1H:26.

14:103 Women in Antiquity 3 s.h.
Attitudes toward women and the role of women in ancient Greek and Roman society; selected works of ancient authors—male and female—and modern critics. GER: humanities.

14:104 Ancient Athletics 2-3 s.h.
Physical surroundings, cultural context, and ancient literature pertaining to ancient sports that serve as the basis for modern track and field events. Same as 27:104, 28:117.

14:107 Ancient Views of Justice 3 s.h.
Ancient writers' thoughts on justice; authors include Hesiod, Aeschylus, Sophocles, Euripides, Aristophanes, Plato, Aristotle, Cicero, and Epictetus. GER: humanities.

14:108 Greek Drama in Translation 3 s.h.
The works of Aeschylus, Sophocles, Euripides, and Aristophanes, their literary significance in fifth-century B.C. Athenian democracy; how ancient plays were produced, their social and religious significance, and the issues each play raises for that society and our own. GER: humanities. Same as 49:191.

14:109 Greek Jewish Literature 3 s.h.
Study in English translation of selected works written originally in Greek (history, fiction, preaching, and oracular, epic, and dramatic poetry); begins with earliest fragments and continues to works of Philo and Josephus. Same as 32:115.

14:110 Early Greek Art 3 s.h.
Architecture, sculpture, painting, and minor arts from Mycenaean to Hellenistic times. Same as 1H:126.

14:111 Classical Greek Art 3 s.h.
Continuation of 14:110. Same as 1H:127.

14:112 Classical Mythology 3 s.h.
Lecture on classical myths and legends; nonclassical mythologies mentioned for comparative purposes. GER: humanities.

14:114 Greek Vase Painting 3 s.h.
Survey of Greek painted pottery from Protogeometric to Hellenistic times. Same as 1H:128.

14:117 Hellenistic Art 3 s.h.
Same as 1H:129.

14:194 Seminar in Ancient Civilization 3 s.h.
Subject matter changes annually.

20:30 Roman Civilization 3 s.h.
Aspects of Roman history, literature, politics, religion, and social structure; provides a broad introduction to Roman society from its beginnings to the second-century A.D. GER: historical perspectives.

20:101 Greek and Latin for Vocabulary Building 3 s.h.
Emphasizes memorization of Greek and Latin stems, prefixes, and suffixes; analysis of word-sets; principles of English word formation. Same as 8W:101.

20:103 Medical and Technical Terminology 2 s.h.
Computer-assisted instruction in medical and scientific terms derived from Greek and Latin; no formal classes, students set own pace and schedule; study guide with illustrations.

20:110 Early Roman Art 3 s.h.
Roman architecture, sculpture, painting, and mosaics of republican, imperial, and late antique periods. Same as 1H:132.

20:111 Etruscan Art 3 s.h.
Same as 1H:130.

20:113 Religion and Occult in Antiquity 3 s.h.
The place of occult power in the early religion of Greece and Rome; influences on Graeco-Roman culture of magical practices in other cultures during the pre-Christian period; the advent of Eastern mystery cults. GER: humanities. Same as 32:164.

20:114 Ancient Novel 3 s.h.
Introduction to fictional prose writing in Greece and Rome; students read several Greek romances and two Roman works to show the transition from romance to the novel in antiquity.

20:115 Late Roman Art 3 s.h.

20:116 The Concept of the City: Rome 3 s.h.
Political and social effects of the Roman state on the city of Rome and on the significance of the concept of the city. Readings in English; no Latin or Greek required. GER: historical perspectives.

20:118 Concept of the City: Rome II 3 s.h.

20:119 Methods: Foreign Language 3 s.h.
Aims, subject matter, textbooks, and methods in secondary school teaching. Same as 7S:116, 9:150, 13:120, 35:115.

20:201 Comparative Romance Linguistics 3 s.h.
Same as 9:250, 35:207, 103:262.

COMMUNICATION STUDIES

Chair: Bruce E. Gronbeck
Professors: Charles F. Altman, J. Dudley Andrew, Samuel L. Becker, Steve Duck, Bruce E. Gronbeck, Michael Calvin McGee, Franklin Miller, Donovan J. Ochs, Douglas M. Trank
Professors emeriti: Hugh V. Cordier, Orville Hitchcock, Richard D. MacCann, John Winnie
Associate professors: Randy Hirokawa, George Klingler, John Lyne, Leighton Pierce, Lauren Rabinovitz
Assistant professors: Kathleen Farrell, Robert Kemp, John Peters, Dianne Rucinski, Anita Vangelisti
Instructor: Natasa Durovicova
Undergraduate degree offered: B.A. in Communication Studies
Graduate degrees offered: M.A., Ph.D. in Communication Studies

The Department of Communication Studies is concerned with communication as a means of personal expression and development; as methods people use to adjust themselves to their society and their society to themselves; and as an essential process for the operation of any society, especially a highly technological society. The department also is concerned with communication as artistic as well as functional expression. These concerns are manifested in studies of interpersonal, group, public, broadcast, and filmic communication.

The department has five major divisions, whose emphases and courses are described under the headings of broadcasting and film (B.A., M.A., Ph.D.), communication (B.A.), communication education (B.A. and M.A.), communication research (M.A. and Ph.D.), and rhetorical studies (M.A. and Ph.D.). Freshmen interested in the department should talk with advisers in the University Undergraduate Academic Advising Center; sophomores, juniors, and seniors are assigned departmental advisers. Anyone wishing to take courses other than those fulfilling General Education Requirements must have a 2.30 cumulative grade-point average.

Undergraduate Programs

Students who seek the Bachelor of Arts degree in communication studies must earn a minimum of 30 semester hours as described under "Broadcasting and Film" and "Communication," below. Students who seek teacher certification must earn 33 semester hours as described under "Communication Education," below. In all three of these undergraduate programs, all majors take at least four foundation courses in four core subject areas: broadcasting, communication, film, and rhetoric. Foundation courses in the four core areas are as follows.

Broadcasting

36B:25 Mass Media and Mass Society 3 s.h.

Communication

36C:60 Communication Theory in Everyday Life 3 s.h.

Film

36B:40 Introduction to Film Analysis 3 s.h.
or
36B:51 Survey of Film 3 s.h.

Rhetoric

36C:70 Persuasion in Society 3 s.h.
or
36C:80 Communication and Contemporary Culture 3 s.h.

Admission

To be considered for admission to the department's B.A. programs, applicants must:

Complete by the end of the semester in which application is made at least 56 semester hours of approved undergraduate credit;

Have at least a 2.50 grade-point average on at least three foundation courses representing three different core areas;

Have at least a 2.50 cumulative grade-point average; and

Submit a statement indicating why they want to major in the department, mentioning special talents, interests, or abilities that suggest exceptional promise.

These and other factors are considered by the undergraduate admissions committee. They are minimum criteria; meeting them does not guarantee admission. The number of students admitted each year varies with available instructional resources; this insures that majors receive the highest quality education possible. Students who do not meet the minimum criteria may petition the undergraduate admissions committee. Students are considered for admission to the department three times a year: during the eighth week of regular semesters and the fourth week of summer school.

These admissions requirements are in effect for all students, regardless of when they were admitted to the University. The degree requirements (30 or 33 semester hours, depending on choice of program) apply to students who first enrolled in the University for the 1988 fall semester. Students who enrolled before fall 1988 and who will graduate before fall 1992 may choose to complete the major under the old requirements, which are listed in the 1986-88 *University of Iowa General Catalog*.

No B.A. degrees in communication studies completed under the old requirements will be awarded after August 1992.

Honors

A degree with honors in communication studies requires maintenance of a 3.20 grade-point average, membership in the College of Liberal Arts Honors Program, and completion of an honors thesis in the senior year. The honors thesis, which may be taken for 3-6 semester hours of credit over two semesters, offers a unique opportunity for students to develop expertise and contribute to knowledge in a selected area. As prerequisites to registering for thesis credit, candidates first must choose a faculty member to supervise the project, then have a prospectus for the project approved by that faculty member and the departmental honors adviser. The completed thesis is defended before a committee consisting of the faculty adviser, the departmental honors adviser, and one other faculty member.

Students who enroll in the honors program are eligible to take courses labeled "honors only" in the *Schedule of Courses* and to add an honors designation to any other departmental course by completing an agreement with the course instructor for special work in that course. Forms providing instructions are available from the honors adviser.

Minor

A minor in communication studies requires 15 semester hours of credit in communication studies with a minimum grade-point average of 2.00. Of the 15 semester hours, at least 12 must be in University of Iowa courses numbered 36C:60 or 36B:60 and above.

Graduate Programs

Master of Arts

A student can earn a general M.A. degree in the department or a more specialized degree either in one of the divisions or in some combination of divisions.

Departmental requirements for the Master of Arts degree are:

- A minimum of 30 semester hours, including 36:300 Introduction to Research and at least two courses numbered 200 or above (the requirements for some programs in the department are greater than this minimum);
- A research thesis or, for the nonthesis degree, a graduate seminar paper involving significant original research;
- Successful completion of a six-hour written examination, the scope of which is determined by the candidate's division and graduate committee; and
- At least a 3.00 cumulative grade-point average for all courses in the plan of study.

Applicants for summer session or fall semester whose papers are received by February 1 have the best chance of admission. The minimum cumulative undergraduate grade-point average required for admission in good standing is 2.75.

Educational Specialist (for Junior College Teaching)

Departmental requirements for the Educational Specialist degree are:

- A minimum of 60 semester hours, including 36:300 Introduction to Research; a course in teaching communication; an approved seminar; and at least 19 semester hours completed in the College of Education graduate program in higher education;
- Successful completion of a research report;
- A semester internship in an assigned teaching position;
- Satisfactory performance on a nine-hour written examination covering areas of learning agreed on by the student and his or her graduate committee; and
- Successful completion of such additional requirements as are specified by the departmental division in which the student's work is concentrated.

Doctor of Philosophy

Departmental requirements for the Doctor of Philosophy degree are:

- A minimum of 84 semester hours of graduate credit, excluding dissertation and including a 12-hour sequence in an approved research skill;
- A minimum of 10 semester hours of dissertation credit;
- 36:300 Introduction to Research;
- At least two courses in theory taken within the department, and others as determined by the student's adviser and graduate committee, in consultation with the student;
- Successful completion of a qualifying and a predissertation examination in the student's major research areas;
- A substantial scholarly dissertation;
- A 3.00 minimum cumulative grade-point average for all courses in the plan of study.

Applicants for summer session and fall semester whose papers are received by February 1 have the best chance of admission. Admission decisions are based on composite consideration of the applicant's undergraduate achievement, letters of reference, and other evidence of scholarly potential or achievement, such as Graduate Record Examination (GRE) General Test results and samples of scholarly work.

Facilities

The Communication Studies Building, one of the newest facilities on campus, has been designed specifically to meet both research and technical needs. Included are two television studios, a complete video postproduction facility, a film sound stage, a scene shop, areas for animation and graphics production, a radio studio, and an advanced 24-track audio studio that serves the needs of courses throughout the program. A large pool of equipment is available to support student work in both studio and location settings. Students and scholars have access to a video and film library, individual viewing areas, a lab complex for experimental and survey research, and a computer for research efforts. The Communication Studies Building is one of the best facilities of its kind in higher education.

Interdivisional Courses

36:000 Cooperative Education Internship **0 s.h.**

36:98 Honors Colloquium **1 s.h.**
Prerequisite: 2.30 cumulative grade-point average.

36:99 Honors in Communication Studies **3 s.h.**

36:149 Problems in Communication Studies **arr.**
Consent of instructor required. Prerequisite: 2.30 cumulative grade-point average.

36:178 Workshop in Teaching Communication and Forensics **arr.**
Methods, materials, progression and evaluation in teaching, and supervising students in courses and extraclass activities; opportunities for observation, demonstration, and practice in teaching theater, discussion and debate, and individual speech, dramatic, and forensic events. Prerequisite: 2.30 cumulative grade-point average. Same as 7S:178.

36:179 Workshop Teaching Oral Communication Skills **arr.**
For teachers or others who have an interest in the field; focus on three aspects of the teacher-student relationship—awareness of the student, awareness of self, interaction between teacher and student. Prerequisite: 2.30 cumulative grade-point average.

36:249 Independent Study **arr.**

36:300 Introduction to Research **1 s.h.**
Communication studies as a field of scholarship, selection of research problems, the major lines of research represented in the department, and the bibliographical tools for scholarship in the field.

36:385 Master's Thesis **arr.**

36:685 Ph.D. Dissertation **arr.**

Communication Education

The communication teaching major requires a minimum of 33 semester hours of course work in the Department of Communication Studies. Students must take four foundation courses across four core areas; four state-required communication courses; two theatre arts courses; and any other communication studies course, with the approval of a communication education adviser.

To strengthen both their major and their employment opportunities, students are advised to complete a minor certification in English, reading, or other related fields, and to accumulate a record of achievement in

forensics, broadcasting and film, readers' theater, and theater activities.

Teaching Minor Certification in Communication Studies

Completion of 23 semester hours of course work in communication and theater arts is required. These hours must be approved by an adviser.

Courses

36:107 Directing Forensic Activities 3 s.h.
Planning, organizing, and evaluating forensic programs at the secondary level; covers the establishment of cocurricular forensic programs, prepares student for teaching competitive activities, and justifies cocurricular programs in the secondary schools. Prerequisite: 2.30 cumulative grade-point average. Same as 7S:102.

36:160 Methods: Communication 3 s.h.
Consideration of various patterns in teaching, curricular programs, objectives, instructional methods and materials, effects of oral and written criticism and evaluation, testing and grading, textbooks and references, periodicals and sources of publications; consideration of contemporary communication education theory and practice. Prerequisite: 2.30 cumulative grade-point average. Same as 7S:160.

36:250 Colloquium: Teaching Freshman Rhetoric arr.
Exploration of literature and problems involved in teaching composition, public speaking, and reading. Same as 8P:450.

36:302 Contemporary Communication Education 2-4 s.h.
Designed to increase teaching competence of college instructors; basic learning theories and areas of student competence explored; students devise college-level curriculum and suitable tools for teacher and student evaluation; emphasis on the basic course in communication; students pursue a pedagogical research topic of their choice.

Communication

Within a liberal arts philosophy, communication majors study oral, written, visual, and electronic messages and media, in their environments, from theoretical, critical, historical, and social-scientific perspectives. Students also improve their analytical and practical communication skills through critiqued practice. Combined with related work in mass communication, social sciences, expository prose, journalism, and business (especially marketing and administration), this major prepares students for careers in business, not-for-profit organizations, the media industries, and government. Others use the major as professional preparation for advanced studies in teaching, law, business, and the ministry, and for graduate studies.

To graduate with a B.A. in communication, students must complete 30 semester hours of work in the department, including:

Four foundation courses across four core areas	12 s.h.
At least four additional 36C courses, including at least two numbered above 36C:80	12 s.h.
Any 6 semester hours of additional departmental course work	6 s.h.

The department and division sponsor an internship program, which provides outside work experience, and an active intercollegiate forensics program, the Iowa Forensics Union, located in the International Center. Internships provide opportunities to apply communication knowledge and skills in a variety of settings, such as advertising, public relations, organizational development, politics, personnel, research, and training. In the forensics program, students have an opportunity to work in on-campus debates, with developmental programs designed to improve speech activities in the state, and as members of competitive intercollegiate debate and individual events. Forensics scholarships are available.

Courses

A 2.30 cumulative grade-point average is required for enrollment in all courses except 36C:25, 36C:40, and 36C:60. Additional prerequisites are listed in course descriptions.

36C:30 Communicating in Public 3 s.h.
Intermediate course in public speaking; assumes previous course work (10:1-10:2, 10:3, or equivalent) or other experience in basic processes and practices of speech making; study and experience in more complex forms of informative, argumentative, and persuasive speaking; analysis and criticism of speaking and speakers.

36C:31 Group Communication 3 s.h.
Principles and practical application of group problem-solving techniques; leadership and group participation; projects in social decision and action.

36C:32 Interpersonal Communication 3 s.h.
Introduction to basic concepts involved in studying and explaining informal social interaction between individuals; use of these concepts to explain and evaluate students' own interpersonal skills.

36C:33 Practicum in Debate 1 s.h.
Studies in the theory of interscholastic debate.

36C:34 Communication and Public Affairs 3 s.h.
Practice in informative and persuasive speaking, based on study of current public issues.

36C:35 Business and Professional Speaking 3 s.h.
Techniques and principles of public communication in business, education, and other professions; theory and guided practice.

36C:36 Elements of Debate 2 s.h.
Intended for students interested in debate and debate procedures and those who may teach debate or direct an interscholastic debate program.

36C:37 Organizational Communication: Theory and Practice 3 s.h.
Introduction to major concepts and theories in organizational communication; gives students an opportunity to use these concepts and theories in observing and analyzing communication processes within and between complex organizations; focus on application of organizational communication concepts and theories to actual organizational practices and functioning.

36C:38 Persuasive Communication 3 s.h.
Principles and practical applications of persuasive communication, particularly persuasive speaking; introduction to the analysis of persuasive messages.

36C:40 Theory and Practice of Argument 3 s.h.
Analysis of public argument as practiced in law, social science, politics, and other public arenas, and instruction in the presentation of oral argument; recommended for prospective lawyers, business personnel, debaters, and others interested in controversy. GER: quantitative or formal reasoning. Prerequisite: completion of General Education Requirement in rhetoric.

36C:41 Interviewing 2-3 s.h.
Techniques and principles of interviewing in business, education, and other professions; theory and guided practice.

36C:42 Parliamentary Procedure 1 s.h.
Rules of order for meetings of committees, clubs, and organizations; practice in making and debating motions from floor and in presiding over parliamentary sessions.

36C:43 Organizational Leadership 2-3 s.h.
Principles and techniques of leadership in various organizations; focus on communication methods, motivation, and elements of parliamentary procedure.

36C:50 Nonverbal Communication 3 s.h.
Channels of nonverbal communication; practical applications to everyday contexts and situations.

36C:59 Communication Internship arr.
Application of communication skills and knowledge in work assignments related to the student's academic and career interests; full- or part-time, on or off campus. Offered satisfactory/fail only. Open only to communication studies majors. Consent of instructor required.

36C:60 Communication Theory in Everyday Life 3 s.h.
Surveys theory and research concerning basic skills and processes involved in everyday communication; a lecture-discussion course. GER: social sciences.

36C:70 Persuasion in Society 3 s.h.
Introduction to theories of public persuasion and to types of persuasive campaigns and movements in society; instruction in rhetorical analysis of advertising, political processes, and social unrest.

36C:80 Communication and Contemporary Culture 3 s.h.
Exploration of the social-cultural rules that govern contemporary communication practices; methods for analyzing settings of discourse; communicative habits in conversational games, print and electronic media, and politics.

36C:85 Communication and Conflict 3 s.h.
Mutual implications of communication theories and conflict theories; applications to everyday life.

36C:87 Gender Roles and Communication 3 s.h.
Research and theory on gender roles and communication processes, including the function of communication in gender role development. Same as 131:87.

36C:90 Rhetoric and Politics 3 s.h.
Analytical study of the rhetoric of political campaigns at the national, state, and local levels; discussions with candidates and representatives of the media; opportunity for individual investigations.

36C:99 Doing Communication Research 1-3 s.h.
Guided practice in a variety of communication research methods. Offered satisfactory/fail only.

36C:110 Theories of Human Communication 3 s.h.
Similarities and differences in approaches to the study of symbolic interaction as evidenced in theorists such as Plato, Aristotle, Augustine, Alcuin, Bacon, Priestley, De Quincey, Campbell, Richards, Burke, McLuhan, Goffman, Watzlawick.

36C:111 Intercultural Communication 3 s.h.
Introduction to relationships among culture-based assumptions, values, thought patterns, and communication behavior; includes theory and practice. Same as 42:111.

36C:125 Theories of Persuasion 3 s.h.
Theories of persuasion and research focusing on processes of persuasion.

36C:134 Contemporary Public Communication 3 s.h.
Critical examination of American public communication since World War II.

36C:136 Organizational Communication Processes 3 s.h.
Nature and function of communication in organizations; includes information flow and processing, communication networks, role relationships, decision making in formal organizations.

36C:138 The Rhetoric of Self-Justification 2-3 s.h.
Rhetorical strategies used by persons charged with personal and public shortcomings; case studies range from Demosthenes through contemporary American politicians.

36C:139 Studies in Argument 3 s.h.
Topics vary.

36C:141 Group Communication Processes 3 s.h.
Principles and practical application of group problem-solving techniques; leadership and group participation; projects in social decision and action; requires substantial theory/research project.

36C:142 Interpersonal Communication Processes 3 s.h.
Introduction to theory and research concerning individuals engaged in informal social interaction.

Communication Research

The program in communication research leads to the M.A. or the Ph.D. degree. Programs designed for individual students provide background for and experience in research on interpersonal communication and group communication from a social science perspective with special emphasis on group decision making and relational communication. In addition to general departmental requirements, students study related social sciences and select appropriate courses in the division from those listed below.

Courses

36:305 Contemporary Communication Theory 3 s.h.
Focuses on twentieth-century theorists and schools of thought.

36:321 Organizational Communication: Theory and Research 3 s.h.
Graduate-level survey; examines major concepts, theories, and research trends in organizational communication; focuses on the integration of communication theories and perspectives with organizational theories and perspectives.

36:322 Group Communication: Theory and Research 3 s.h.
Graduate-level survey; examines major concepts, theories, and research trends in small-group communication; provides students with a conceptual/theoretical understanding of the nature and functions of communication processes in small-group settings; emphasis on development of a general theoretical framework for synthesizing and critically evaluating group communication research.

36:323 Research Methods in Communication 3 s.h.
Principles and methods of designing and executing experimental research in communication.

36:324 Communication Research 3 s.h.
Review, analysis, and execution of research in communication from a social-scientific perspective.

36:325 Interpersonal Communication: Theory and Research 3 s.h.
Introductory survey of major theoretical viewpoints and lines of research in interpersonal communication.

36:326 Acquisition of Communicative Behaviors 3 s.h.
Research and theory on acquisition of functional communicative behaviors, including language behavior.

36:327 Persuasion Theory and Research 3 s.h.
Survey of influential social-scientific persuasion theories and research.

36:328 Relational Communication: Theory and Research 3 s.h.
Introduces research and theory on communication in the initiation, development, maintenance, breakdown, and repair of social and personal relationships; open communication and self-disclosure; communicative skills in relationships; process models of relationships.

36:350 Research Practicum arr.
Opportunity to complete individual research projects begun in other contexts or for original research.

36:632 Seminar: Communication Research 3 s.h.
Topics vary.

36:633 Seminar: Rhetorical and Communication Theory Construction 3 s.h.
Criteria for and original work in devising rhetorical and communication theories.

36:634 Seminar: Interpersonal Communication 3 s.h.
Recent theoretical advances and research in interpersonal communication; topics vary.

36:635 Seminar: Organizational Communication Theory 3 s.h.
Recent theoretical advances and research in organizational communication. Same as 19:340.

36:636 Seminar: Persuasion 3 s.h.
Recent theoretical advances and research in persuasion; topics vary.

Rhetorical Studies

The program in rhetorical studies leads either to the M.A. or the Ph.D. degree. It is built upon foundation courses in the history of rhetorical practices, the criticism of rhetorical discourse, and theoretical relationships between rhetorical activities and other dimensions of society. Some foundation courses in history and criticism are offered on the 100 level and are listed under "Communication" in this section of the *Catalog*; the others begin at the 200 level. Foundation courses in rhetorical theory, designed to survey bodies of academic writing about rhetoric, are offered at the 300 level. Advanced courses in special areas of rhetorical theory are offered at the 400 level. Proseminars (500 level) and seminars (600 level) allow students to develop expertise in various historical, critical, and theoretical approaches to rhetoric and communication.

Master of Arts

The M.A. program in rhetorical studies stresses basic knowledge of rhetorical history, criticism, and theory. That goal usually is met by work in the division and in other parts of the department and University. The degree is intended to build a strong foundation for teaching in high schools and junior colleges or for proceeding to the doctorate. Efforts are made to tailor individual programs of study to students' needs and career goals. Minimal requirements for the M.A. in rhetorical studies include:

36:300 Introduction to Research;

At least 15 semester hours of courses in rhetorical studies, including a seminar (any course numbered 500 or above);

At least 6 semester hours of courses in other divisions of this or related departments; and

A comprehensive examination across three areas of study determined by students and their committees.

Doctor of Philosophy

The program leading to the Ph.D. in rhetorical studies is designed to give candidates a mature grasp of the various specialties and perspectives embraced in this division and to develop research competence essential to a life of productive scholarship.

Work in related departments—political science, history, sociology, English, comparative literature, American studies, and journalism—complements rhetorical studies course offerings. Many doctoral students also do extensive work in broadcasting, film, or communication research to improve their range of teaching opportunities and their research skills.

Persons who want information on basic requirements should write to the department. Teaching and research assistantships are available; evaluation of these applications begins mid-February each year.

Courses

36R:230 Rhetorical Criticism 3 s.h.
Survey of approaches to the rhetorical analysis of communicative artifacts, acts, and events; introduction to the arts of rhetorical-critical essay writing.

36R:231 Greek and Roman Public Address 2-4 s.h.
Historical and critical study of public oral and written communication from the fifth century B.C. to the third century A.D.; consideration of Sophists, selected Attic orators, Cicero, and early church fathers.

36R:233 British Public Address 2-4 s.h.
Historical and critical study of the evolution of liberalism, from the reign of Elizabeth I to the accession of Elizabeth II, 1559-1952.

36R:235 American Public Address: Colonial America through Reconstruction 2-4 s.h.
American public discourse in legislatures, law courts, public gatherings, pamphlets, and newspapers.

36R:236 American Public Address: Gilded Ages through Vietnam 2-4 s.h.
See 36R:235.

36R:301 Classical Rhetoric 2-4 s.h.
Theories and philosophies of discourse in the ancient world. Same as 8:267.

36R:302 Modern Rhetoric 2-4 s.h.
History of rhetorical theory from 1765 to 1965. Same as 8:268.

36R:303 Rhetoric and Philosophy 2-4 s.h.
Survey of contemporary philosophical approaches to the study of rhetoric.

36R:304 Rhetoric and Social Theory 2-4 s.h.
Survey of discourse theories constructed to explain the social consequences of signification, representation, and symbolic action, with emphasis on rhetoric, structuralism, and *Ideologiekritik*.

36R:305 Rhetoric and Argument Theory 2-4 s.h.
Survey of theoretical approaches to the study of argumentation and of the key issues at dispute in contemporary conceptualizations of argument.

36R:306 Philosophies and Methods of Historical Research 2-4 s.h.
Problems and practical methods of researching original historical materials; work in archives, textual analysis, document citation.

36R:403 Studies in Language Theory 2-4 s.h.
Analytical and critical examination of theories of language—semiotics, speech acts, and philosophy of language, with particular emphasis on their relationship to rhetoric. Same as 8:306.

36R:404 Ideology and Hegemony 2-4 s.h.
Analytical and critical examination of Marxist and post-Marxist theories of the relationship between communication and social control.

36R:405 Communication and Dramaturgy 1-4 s.h.
Analytical and critical examination of theories of dramatism and dramaturgy, especially their utility in accounting for patterns of human communication.

36R:406 Studies in Political Communication 2-4 s.h.
Analytical and critical examination of political and communication theories, especially their utility in explaining the operation of political discourse.

36R:503 Proseminar: Semiotic Analysis 2-4 s.h.
Studies of major semiotic theorists and the applicability of their concepts to the analysis of communication and communication artifacts.

36R:504 Proseminar: Interpretation and Criticism 2-4 s.h.
Studies of major theories of philosophical hermeneutics

and their applications in the study of rhetorical theory and public address.

36R:505 Proseminar: Rhetoric of Inquiry **2-4 s.h.**
Studies in the analysis of academic discourse in special fields, particularly of the function of rhetoric in establishing conditions and criteria of truth.

36R:601 Seminar: Public Address **1-4 s.h.**
Guided investigations of selected periods of, or approaches to, the history and criticism of discourse addressed to the public; topics vary.

36R:602 Seminar: History of Rhetorical Theory **1-4 s.h.**
Guided investigation of selected periods of, or approaches to, rhetorical speculation; topics vary.

36R:603 Seminar: Argument **2-4 s.h.**
Guided investigation of selected philosophies (ethics, logics, rhetorics, and epistemologies) of argument; topics vary.

36R:604 Seminar: Contemporary Rhetorical Theory **2-4 s.h.**
Guided investigations of particular perspectives, theorists, and/or theories dominating contemporary conceptual thought; topics vary.

36R:605 Seminar: Communication, Culture, and the Popular Arts **2-4 s.h.**
Selected theories of popular culture and/or selected forms and genres of popular arts texts.

36R:607 Seminar: Rhetoric and Culture **1-4 s.h.**
Guided investigations of cultural theories and their utility in accounting for communication practices.

Broadcasting and Film

Bachelor of Arts

This program is intended for students interested in film or electronic media as the focus of a general liberal arts education. It assumes that anyone pursuing a career in these areas should not only acquire technical expertise but also should ground that expertise in an understanding of mass media's place in personal and cultural experience. Conversely, it assumes that no one can understand the history, theory, and criticism of the electronic or film media totally apart from experience and knowledge of production. As study areas, theories of aesthetics, culture, and communication all come together in this program, making it an excellent choice for those who want to study people and their mediated creations.

Students emphasizing production learn to write, plan, shoot, edit, and present film, radio, and television programs. In addition, students obtain a background in the history of the mass media so that they understand reasons for the industry's present state and possible alternatives. A grounding in media theory and criticism teach students to appreciate what goes into creating a successful work and to understand the impact that creative and economic/political decisions may have on audiences and society at large.

To graduate with a B.A. in broadcasting and film, students must complete 30 semester hours in the department, including:

Four foundational courses across four core areas 12 s.h.
36B:35 Introduction to Broadcast and Film Production 3 s.h.
At least three advanced courses (numbered above 36B:60) in one of the subtracks: broadcast studies, film studies, or production studies 9 s.h.
Any 6 semester hours of additional departmental course work 6 s.h.

Graduate Programs

Three programs lead to the Master of Arts degree: media/broadcast studies, film studies, and production studies. Candidates in media/broadcast studies emphasize critical, theoretical, historical, scientific, and political-economic issues during their course of study. Candidates in film studies develop broad knowledge of the discipline through a 36-semester-hour course of study in critical, theoretical, and historical topics. Production studies candidates develop significant knowledge in these scholarly areas in addition to their creative work in film, television, or audio.

The Ph.D. programs in both broadcasting and film are individually tailored by each candidate and an advisory committee to develop expertise in research.

Courses

A 2.30 cumulative grade-point average is required for enrollment in all courses numbered through 36B:195, except 36B:25, 36B:51, 36B:146, and 36B:147. Additional prerequisites are listed in course descriptions.

36B:25 Mass Media and Mass Society **3 s.h.**
Introduction to the processes and effects of mass communication; how communications media operate in the United States; how mass communication scholars develop knowledge. GER: social sciences.

36B:35 Introduction to Broadcasting and Film Production **3 s.h.**
For the student with no previous experience; focus on short projects with television productions, super-8 films, and audio productions. Projects emphasize formative principles and effectiveness of communication. Prerequisite: sophomore standing. Same as 19:35.

36B:40 Introduction to Film Analysis **3 s.h.**
Methods of analyzing various kinds of films, with emphasis on classic narrative works from the American and European traditions; methods studied include shot-by-shot breakdown, narrative segmentation, auteur, and genre. Same as 48:60.

36B:46 Broadcast Programming **3 s.h.**
Programming practices, strategies, and operating procedures of radio and television stations; topics include audience research, program acquisition, scheduling, formats, syndication, and promotion. Prerequisite: 36B:75.

36B:47 Mass Communication Advertising **3 s.h.**
Uses of the mass media for advertising campaigns: client and consumer research, marketing strategies, media buying, copywriting, production, and media comparisons. Prerequisite: 36B:75.

36B:48 Broadcast Management **3 s.h.**
Management practices in radio and television operations: budgeting, staff, audience research, programming, promotion, sales, labor relations, government regulation, and community responsibility. Prerequisite: 36B:75.

36B:50 Contemporary Cinema **3 s.h.**
Analysis and criticism of current American and foreign cinema; in-depth study of types, styles, directors, examples; relationships between movies and film industries, cultural contexts, and the individual moviegoing experience.

36B:51 Survey of Film **3 s.h.**
Introduction to film history, theory, and criticism, emphasizing technology, techniques, and cultural functions of the medium; weekly screenings expose students to narrative, documentary, and experimental films. GER: humanities.

36B:52 Film and Society **3 s.h.**
Social relationships between motion pictures and American culture, both historical and contemporary; censorship and treatment of social issues; representation of minorities in cinema, roles of minority groups in filmmaking.

36B:53 Women and Media **3 s.h.**
Examination of representations of women created by the media, as well as the role of women in media organizations.

36B:59 Practicum in Broadcasting and Film **arr.**
Internship experiences working in professional mass communication organizations. Offered only pass/nonpass. Consent of instructor required. Prerequisite: major status.

36B:60 Introduction to Film Theory **3 s.h.**
Theoretical approaches to cinema as a language, art form, and social expression; emphasis on major historical positions in classical film theory and recent developments.

36B:75 American Broadcasting **3 s.h.**
The broadcasting industry in the United States; emphasis on economic and corporate structure, regulation, and mode of operation at both the station and network level.

36B:80 Mass Communication and American Democracy **3 s.h.**
Introduction to the philosophical foundations of American democracy; focus on contemporary issues of news, media and politics, technology, and freedom of speech. Prerequisite: 36B:25 or consent of instructor.

36B:83 Media and Politics **3 s.h.**
Political media content; relationships between media industries and other institutions; political impact of contemporary political media content on audiences and other institutions.

36B:85 Mass Media and Cultural Production **3 s.h.**
Critical analysis of mass media products, with emphasis on television/cable programming.

36B:95 Mass Communication: Processes and Effects **3 s.h.**
Major social-scientific theories and research on the processes, functions, and impact of mass communication for individuals and societies. Prerequisite: 36B:25.

36B:103 Radio Production **3 s.h.**
Principles and practices of contemporary radio production and programming. Prerequisite: 36B:35.

36B:104 Radio Workshop **3 s.h.**
Independent creative work for students who have completed and demonstrated outstanding talent in 36B:103.

36B:105 Advanced Audio Production **3 s.h.**
Producing in the multitrack recording studio with the goal of learning both supervisory and organizational skills; projects include recording and mixing of musical groups, dramas, commercials, and film-TV sound tracks.

36B:110 Television Production I **3 s.h.**
Emphasis on the studio as a live production facility, with exercises in interview, news show, demonstration, and other forms typical of local station or cable operation. Prerequisite: 36B:35.

36B:111 Television Production II **3 s.h.**
Directing the large-scale studio production; emphasis on developing a competent production team to solve production management and design problems, blocking and shooting, and depending on the nature of the project, extensive post-production. Prerequisite: 36B:110.

36B:112 Television Production: Selected Topics **3 s.h.**
Special emphasis on a single form; sample topics are video art, commercials, instructional programs, interactive systems, variety formats. Prerequisite: 36B:110.

36B:114 Film Production I **4 s.h.**
Beginning 16mm motion picture production; short assignments in basics of camera operation, sound recording, and editing; final project is production of short nonsync-sound film of student's own design. Prerequisite: 36B:35.

36B:115 Film Production II **4 s.h.**
Further training in use of 16mm sync-sound camera, Nagra recorders and microphones, and recording studio; introduction to soundstage through crew exercises in lighting and sync-sound shooting; emphasis on editing, sound track building, and re-recording techniques; students produce a short film with a mixed sound track. Prerequisite: 36B:114.

36B:116 Film Production: Selected Topics 4 s.h.
In-depth exploration of a selected topic in motion picture production, such as sound-image experimentation, animation, lighting, and studio techniques. Prerequisite: 36B:114.

36B:117 Electronic Field Production 3 s.h.
Single-camera shooting on location, with emphasis on videotape editing; exercises oriented to television news spot, mini-documentary, and light feature; film techniques with television technology. Prerequisite: 36B:110 or 36B:114.

36B:118 Production Workshop 1-4 s.h.
For the advanced student with an individual project (either film or television) of some magnitude; entrance based on student's proposal and previous work; class sessions are group meetings for discussions of common problems, screenings of work in progress, criticism. Prerequisite: 36B:115 or 36B:111 or 36B:117.

36B:126 Technology of Film/TV Production 3 s.h.
Emphasis on learning the specialized vocabulary and underlying scientific principles that apply to current technical aspects of film and TV production.

36B:128 Broadcasting and Film Writing 1-3 s.h.
Exercises in visualization, sequencing, and dialogue; preparation of treatment and screenplay for a theatrical or television fiction film; tutorial and small-group discussions of script problems. May be repeated. Prerequisites: courses in broadcasting and film study or production, and advanced work in writing.

36B:130 History of Broadcasting 3 s.h.
Development of the structure, economics, and programming of the broadcast media; emphasis on broadcasting as an economic and cultural form.

36B:141 Documentary Film 3 s.h.
Historical and critical issues of the documentary as reportorial, experiential, persuasive, and artistic form.

36B:142 Film and Ideology 3 s.h.
Study of films and theories illuminating relationship among producers of images, consumers of images, and structure of images; often focuses on particular types of films, e.g., those about women, African-Americans, violence, or politics.

36B:143 Cinema and Culture 3 s.h.
The particular interplay of cinema with other aspects of important cultural periods or movements, such as those of Weimar Germany and France between the wars, and Depression America; focus changes; emphasis on the living role of cinema in history. Same as 48:143.

36B:144 American Silent Film 3 s.h.
A comprehensive survey of the technology, economics, directors, stars, and films of the silent era; emphasis on films in the context of changing American culture before 1927.

36B:145 American Film 1927-1960 3 s.h.
A comprehensive survey of the industry, directors, stars, genres, and films of the early and classic sound era; emphasis on studio policies and styles, key directors, and the relationship between American culture and the narrative strategies of particular films and genres.

36B:146 European Film History 3 s.h.
Movements in Europe most significant in film history; silent cinemas of Sweden, Germany, and Russia; films of France in the '30s; postwar Italian cinema. GER: humanities.

36B:147 French Cinema and Culture 3 s.h.
History of film in French culture; lectures on French culture, analysis of films, and discussion of relation of filmmakers to politics, religion, etc. GER: foreign civilization and culture. Same as 9:147.

36B:148 National Cinema 1-3 s.h.
The history of the cinema as art and culture industry in one of the following: England, Italy, Japan, China, India, Spain, Germany, Russia, Eastern Europe. GER: foreign civilization and culture, humanities.

36B:149 Film Criticism 3 s.h.
Study of purposes, presuppositions, and styles of film criticism, from journalistic to scholarly approaches; theoretical positions related to areas of concern to film critics.

36B:150 Issues in Film Theory 3 s.h.
Introduction to major theoretical positions: Gombrich and Arnheim versus Kracauer; Eisenstein and Pudovkin versus Bazin; structuralism versus phenomenology; recent developments in theory.

36B:152 The Sexes and Film 3 s.h.
Primarily surveys American films from 1920s to 1980s, centering on the images of the sexes and how these images relate to society. Same as 131:152.

36B:153 Film Theory and Practice 1-3 s.h.
Focus on a particular type of film (documentary, animation, experimental) or a particular issue in film theory (sound, narrative structure, point of view) through a combination of readings, viewings, and production; theoretical issues applied in class projects and individual student productions. Consent of instructor required.

36B:154 National Cinemas of Latin America 3 s.h.
History of the cinema as art and cultural industry in a specific Latin American nation, e.g., Argentina, Brazil, Cuba, Mexico. May be repeated. Same as 35:147.

36B:155 Literature and the Film 3 s.h.
Analysis of a specific topic, technique, or problem common to literature and film; focus on theoretical concerns involved in comparing literary with filmic renditions of the same material. Same as 8:173, 48:173.

36B:156 Latin American Cinema Survey 3 s.h.
Introduction to political and aesthetic aspects of Latin American film; films and filmmakers of key countries and the cultural situation out of which their films arise. Recommended: knowledge of Spanish. Same as 35:145.

36B:157 Film and Art Movements 3 s.h.
Experimental and independent film in the context of twentieth-century avant-garde movements.

36B:158 Narrative and Related Art Forms 3 s.h.
Study of narrative theory combined with application to a specific corpus of films and related works in another medium: the novel, theater, one of the plastic arts, or one of the performing arts. Same as 8:172, 48:172.

36B:160 Film Styles and Genres 3 s.h.
Examines films in terms of groupings: genre (e.g., the Western), style (e.g., the New Wave); topics vary. May be repeated.

36B:161 Film Authors 3 s.h.
Focuses on work and vision of a single filmmaker, or compares two or more filmmakers; course intensifies student's knowledge of film history, and critical and analytic thinking and writing about film. May be repeated.

36B:176 Proseminar in Cinema and Culture 1-2 s.h.
Research and discussion of the Institute for Cinema and Culture symposium topic. Same as 48:176.

36B:179 Communication Technologies in History 3 s.h.
Theory and history of communication technology and civilization; how technologies have shaped societies, cultures, politics, art, and people's lives. Prerequisite: 36B:25 or consent of instructor.

36B:180 Communication Technologies and Social Change 3 s.h.
Technology- and communication-centered theories of society in the context of historical consideration of social changes wrought by invention and innovations in printing, telephony, broadcasting, etc. Prerequisite: 36B:130.

36B:181 Criticism of Broadcasting 3 s.h.
Introduction to theories and practice of media criticism; reading of critical approaches; writing of critical analyses of the structure and/or content of radio and television.

36B:182 Cultural History of American Advertising 3 s.h.
Historical and critical study of the evolution of a consumer culture in the United States since the mid-nineteenth century. Prerequisite: 36B:25.

36B:183 Mass Communication Research Methods 3 s.h.
Basic research methods for evaluating communication research; for students with little or no background in social science methodology.

36B:184 Cultural History of American Television 1946-1975 3 s.h.
Evolution of the structure and content of U.S. television vis-a-vis evolving consumer culture since the end of World War II.

36B:185 Media Industries and Organizations 3 s.h.
Social-scientific theories and research on the organization and economics of media work; their impact on media content and performance. Prerequisite: 36B:25.

36B:186 Information Technology and the Organization 3 s.h.
Differences in communication processes, management, and job performance and satisfaction; organizations dependent on industrial technology compared with those relying on information technology.

36B:190 Cultural Approaches to Mass Communication 3 s.h.
Studies the interconnections of culture and economics by examining the industrial structure of modern cultural production and the textual/symbolic structure of mass-mediated cultural artifacts; explores current theories through students' research projects. Prerequisite: 36B:85 or 36B:40.

36B:191 History of American Mass Communication Research 3 s.h.
Overview of twentieth-century American theories and research on media and society; may include media and democracy, the arts, children, society, and consumer culture. Prerequisite: 36B:25 or consent of instructor.

36B:195 Contemporary Issues in Mass Communication 2-3 s.h.
Major issues involving the electronic media; focus varies.

36B:211 Approaches to Culture 3 s.h.
Survey of U.S. theorizing and research on the relationship between mass-mediated artifacts, media industries, and culture.

36B:218 Advanced Production Workshop 1-4 s.h.

36B:219 Studies in Film Production 2 s.h.

36B:221 Media Criticism 3 s.h.
Methods and assumptions underlying critical study of mass communication; focus on television and video forms.

36B:231 Theories of Mass Communication 3 s.h.
Major theories of the processes and effects of mass communication; emphasis on the theoretical bases of social-scientific research.

36B:240 Women and Television in American Culture 3 s.h.
Relationships posited between women and television through feminist critical scholarship and cultural analysis. Same as 45:240, 131:240.

36B:250 Writing About Cinema 1-3 s.h.
Analysis and criticism of films and film literature; individual or small group study.

36B:263 Advanced Film Theory 3 s.h.
In-depth study of a particular topic in recent film theory, such as point-of-view, sound, semiotics, or feminism.

36B:270 Latin American Cinema History 3 s.h.
In-depth study of a particular area of Latin American cinema history: a specific group of national cinemas, the ideological and political function of cinema, the influence of television, and other forms of popular narrative. Same as 35:270.

36B:276 Narrative Modes 3 s.h.
Same as 9:265, 48:276.

36B:300 American Film and American Culture 3 s.h.
In-depth study of the relationships between American film and American culture as developed within a particular approach, period, or subject; topics vary. Same as 45:300.

36B:303 Media Industry Systems 3 s.h.
Structural examination of mass communication and popular culture systems; emphasis on economics, industrial organization, technology, and institutionalization.

36B:305 Mass Communication and Politics 3 s.h.
Approaches to studying media and politics, media and elections, political aspects of news and entertainment, regulation and public policy.

36B:306 Mass Media and Social Change 3 s.h.
Historical, political, technological, and social origins and rationales for employing the mass media to instantiate social change.

36B:307 Mass Media and Public Opinion 3 s.h.
Public opinion examined in relation to the institutional forces shaping its definitions; political uses and impact of public opinion, social scientific and critical approaches to its study; role of the mass media in shaping and reflecting public opinion in democratic systems.

36B:311 Influences on Film Production 2-3 s.h.
Film production influenced by organization of the industry, growing technology, patterns of distribution; individual research projects.

36B:320 Levels of Mass Communication Theory 3 s.h.
Cognitive and social theories underlying mass media studies; problems of integrating communication theories involving individuals and those involving societies.

36B:330 Critical Approaches to Mass Communication 3 s.h.
Overview of critical communications research; political-economic and cultural approaches as practiced by American and European scholars.

36B:335 Media and Modernity 3 s.h.
Intertwining of the mass media with the historical changes and experiences called modernity; media in modern culture through social structures and cultural forms.

36B:340 History of Mass Communication Theory 3 s.h.
Survey of mass communication theory from Locke to Lazarsfeld; emphasis on intellectual and historical contexts; politics of theory and theory of politics.

36B:348 The Audience Experience 3 s.h.
The mass communication process from the audience's point of view; spectatorship and spectacle, texts as experienced, interpretation in communication, and communication pragmatics.

36B:349 Topics in Mass Communication Scholarship 1-3 s.h.
Theory and research on various problems in mass communication; focus varies.

36B:350 Communication and Community 3 s.h.
Communication and community: how they make each other possible, limit each other; how changing communication technologies affect community; how changing community structures affect communication.

36B:605 Seminar: National Cinema 1-4 s.h.
Emphasis on a specific national cinema: France, Great Britain, Italy, Sweden, Russia, Japan.

36B:610 Seminar: Film Aesthetics and Criticism 1-4 s.h.
Detailed study of a historically important problem or theoretical position in film studies, such as French cinema criticism between the wars, the Frankfurt School and popular culture, Russian formalism, Merleau-Ponty and the phenomenological tradition.

36B:615 Seminar: Film Theory 1-4 s.h.
Intensive study of a specific problem of recent film theory, such as cinema semiotics, psychoanalysis and cinema, feminist film theory, politics of location, and racial difference.

36B:616 Seminar: Film History 1-4 s.h.
Focus on a limited period or topic in film history; important historiographical and theoretical problems.

36B:620 Seminar: Critical Research in Mass Communication 2-4 s.h.
A specific research question in terms of theory and research in political economy and/or cultural studies; topics vary.

36B:623 Seminar: Mass Communication 1-4 s.h.
Focus varies.

36B:624 Seminar: Cultural History of American Advertising 2-4 s.h.
The role of American advertising in the evolution of modern life with its pervasive consumer culture and submissive therapeutic ethos.

36B:625 Seminar: Mass Communication Research 2-4 s.h.
Opportunities to carry out research exploring theoretical ideas about mass communication processes, functions, and impact; topics vary.

COMPARATIVE LITERATURE

Chair: Herman Rapaport
Professors: J. Dudley Andrew, Stavros Deligiorgis, Rudolf E. Kuenzli, Alan F. Nagel, Herman Rapaport, Steven Ungar, Daniel Weissbort
Associate professors: Thomas E. Lewis, Adriana Méndez Rodenas, Maureen Robertson
Assistant professor: Sabine Gölz

Faculty assisting in the program: In addition to its own faculty, the Program in Comparative Literature calls upon faculty members in other areas, including classics, Asian languages and literature, communication studies, English, film, French and Italian, German, history, Spanish and Portuguese, Russian, and theatre arts.
Undergraduate degree offered: B.A. in Comparative Literature
Graduate degrees offered: M.A., M.F.A., Ph.D. in Comparative Literature

The Program in Comparative Literature presents literature as the subject of international and interdisciplinary study and provides a basis for intensive work in literature, literary theory, and critical method.

Undergraduate Program

The undergraduate major in comparative literature provides an individualized program of literary and interdisciplinary study designed to promote cultural awareness, to increase speaking and writing skills, and to develop capacities for systematic reasoning. Students who major in comparative literature may expect to acquire training in foreign language, to gain an international perspective on literature, and to become acquainted with interdisciplinary approaches to cultural study. In conjunction with an appropriate overall curriculum, the major in comparative literature can offer effective preparation for professional studies in fields such as law and business. It also offers excellent preparation for graduate work in the humanities.

The successful pursuit of comparative literature requires that students study one foreign language and literature in historical context. Familiarity with the literatures and cultures of other nations is afforded by theoretical inquiry into the nature of literature itself and by course work that investigates relations among various national literatures and between literature and other arts (such as film, painting, or translation). Course work in comparative literature also emphasizes interdisciplinary relations between literature and other areas of study, such as history, philosophy, linguistics, anthropology, law, and psychology.

Majors in comparative literature do not proceed through a strictly prescribed common curriculum toward the B.A. degree. Working closely with faculty advisers, students develop coherent, individualized programs of study that reflect their own interests and developing skills. In addition to completing General Education Requirements for the B.A. degree, majors complete a minimum of 36 semester hours in courses distributed across three areas as follows.

Comparative Literature

Students should take the following courses, for a total of 21 semester hours.

48:40-41 Major Texts in World Literature I-II	6 s.h.
48:50 Non-Western Literary Traditions	3 s.h.
48:95 Undergraduate Seminar	3 s.h.
48:100 Introduction to Critical Problems	3 s.h.
Elective comparative literature course work at the 100 level	6 s.h.

Foreign Literature

Students should take 9 semester hours of courses in one foreign literature, read in the original language, in addition to courses taken to satisfy the General Education Requirement in foreign language. One course in composition and conversation may count toward the major.

Related Areas

Students should take 6 semester hours of courses in a related area (e.g., English and American literature, film, linguistics, anthropology, philosophy, history) or courses in a second foreign literature.

Minor

Students majoring in other disciplines may acquire a minor by completing 15 semester hours of work in comparative literature, with a minimum grade-point average of 2.00. Of these 15 semester hours, at least 12 must be in courses at The University of Iowa numbered 48:95 and above.

Honors

To graduate with honors in Comparative Literature, students must meet eligibility standards listed in the Guide to Honors publication of the College of Liberal Arts. They must identify an area extending beyond regularly offered course work and must complete a project in consultation with one or two faculty members, including the major adviser. For more information consult the Program in Comparative Literature, office 425 EPB.

Graduate Programs

Master of Arts

The Master of Arts degree in comparative literature requires 37 semester hours of study of literature in an international context, concentrating on two or more national literatures and on the theory and study of literature in general. In consultation with faculty advisers, students combine courses in comparative literature and in the individual allied departments to design a coherent program of study.

Formal degree requirements may be satisfied by a written examination on reading lists agreed upon by students and their advisers, or by a written thesis and an oral examination on the thesis and its relation to problems and issues in comparative literature. The M.A. also may be awarded upon successful completion of the comprehensive examination for the Ph.D.

Master of Fine Arts in Translation

The M.F.A. in translation promotes creative performance and study of languages, literatures, criticism, and cultural history. The aim of the program is to encourage the practice of literary translation and to bring about greater awareness of its tradition, its contributions, and its possibilities. The Iowa Translation Workshop is the central course in the program.

Admission to the program is made on the basis of a submitted portfolio, including translations into and original writing in English, as well as supporting evidence of competence. Degree requirements include a thesis—usually a book-length collection of poems or stories, or a short novel, translated out of the original language into English and accompanied by a critical introduction.

A total of 48 semester hours of graduate study is required, 24 of which must be taken at The University of Iowa. Besides workshop hours, course work includes study of the foreign literature(s), creative writing (stylistics, etc.), and criticism. Thus, M.F.A. students may expect to take courses in foreign language departments, the creative writing program, and the English department, as well as in comparative literature.

Doctor of Philosophy

Students seeking a doctorate in comparative literature study at least three literatures, one in historical depth and two others in limited areas of specialization. Students are encouraged to include an interdisciplinary area of concentration. All candidates devote a portion of their programs to comparative study, bringing the several areas into focus. Specific areas and interrelations of areas are determined by the student in consultation with appropriate faculty members.

Some typical critical and comparative areas are European Renaissance, romanticism, structuralism and poststructuralism, narrative theory in literature and film, symbolist poetics and modern literature, oral literature in antiquity and today, and satire, rhetoric, and the theory of social interaction.

The Ph.D. dissertation should demonstrate the candidate's ability to write a substantial piece of scholarship or criticism. A translation of a work of sufficient significance and linguistic complexity, preceded by a critical introduction, may serve as an acceptable dissertation. The final oral examination centers on the dissertation and its background.

Admission

The study of literature across linguistic boundaries requires special training in languages. A thorough knowledge of at least one foreign language is required for admission to the M.A. course of study; knowledge of at least two foreign languages is a prerequisite for doctoral study.

Further information is available in the procedural guide for graduate students in comparative literature, available from the program office.

Courses

48:000 Cooperative Education Internship 0 s.h.

48:40 Major Texts in World Literature I 3 s.h.
Reading and analysis of major literary texts from Homer to the Renaissance in chronological sequence; emphasis on the interrelationship of literature and history. GER: humanities. Same as 8:40.

48:41 Major Texts of World Literature II 3 s.h.
Reading and analysis of major literary texts from Neoclassicism to 1900 in chronological sequence; emphasis on the interrelationship of literature and history. GER: humanities. Same as 8:41.

48:50 Non-Western Literary Traditions 3 s.h.
Introduction to the literature, in its historical and cultural context, of Africa, East Asia, the Near East, or South Asia; readings in translation may be organized under special topics (e.g., women, literature and revolution, lyric tradition). GER: humanities. Same as 39:50.

48:60 Introduction to Film Analysis 3 s.h.
Methods of analyzing various kinds of films, with emphasis on "classic" narrative works from the American and European traditions; methods studied include shot-by-shot breakdown, narrative segmentation, auteur, and genre. Same as 36B:40.

48:70 Comparative Arts 3 s.h.
Introduction to the cultural and aesthetic issues arising from the side-by-side investigation of several art forms, including literature, cinema, painting, music, opera, and architecture; periods, schools, styles, and their theories.

48:95 Undergraduate Seminar 3 s.h.
Senior seminar; focus on a significant text or critical problem; course context reflects current interests of regular and visiting faculty; students develop individual research projects. Same as 8:99.

48:98 Honors Tutorial arr.

48:99 Individual Study arr.

48:100 Introduction to Critical Problems 3 s.h.
Junior-level methods course; introduction to a variety of critical approaches to the phenomenon of literature. Same as 8:100.

48:106 European Literature of the Nineteenth Century 3 s.h.
International and national perspectives on literary movements, works, and authors before 1900. Same as 8:109.

48:113 Literary Genres in European Literature I 3 s.h.
How genre definitions contribute to the understanding of related literary works; may deal with one or more genres (epic, romance, comedy, historical novel). Same as 8:183.

48:115 Literary Genres in European Literature II 3 s.h.
Continuation of 48:113. Same as 8:126.

48:116 History and Theory of Translation 3 s.h.
Survey of the tradition of translation, primarily in English literature, and of the development of ideas about translation from Cicero to Pound; covers classical, biblical, and contemporary areas. Same as 8W:116.

48:127 Contemporary Scene in Poetry 3 s.h.
Same as 8:127.

48:128 Modern Poetry and Poetics 3 s.h.

48:136 Philosophy of Literature 3 s.h.
Same as 26:136.

48:140 Contemporary Scene in Fiction 3 s.h.
Same as 8:140.

48:141 Chinese Literature: Poetry 3 s.h.
Same as 39:141.

48:142 Modern Japanese Fiction in Translation 3 s.h.
Same as 39J:142.

48:143 Cinema and Culture 3 s.h.
Examination of films in one or more countries and periods; emphasis on interrelations among the arts, the prevailing social conditions, and the various industries and technologies reflected in films. Same as 36B:143.

48:150 Literature and Society 3 s.h.

48:151 Literature and Anthropology 3 s.h.
Same as 8:151, 113:109.

48:153 Fiction as History 3 s.h.
Same as 35:146.

48:155 The Literary Tale 3 s.h.
Examination of structural features and social implications of the mode of oral storytelling in written literature; reading list includes both Western and Asian texts. Same as 39:155.

48:158 East-West Literary Relations 3 s.h.
Same as 39:158.

48:160 Cultural Identity in Caribbean Literature 3 s.h.
Same as 35:175.

48:167 Literature and Psychology 3 s.h.
Literary texts, themes, and theory; emphasis on the interrelations of literary criticism, linguistics, and psychology. Same as 8:175.

48:172 Narrative and Related Art Forms 3 s.h.
Same as 8:172, 36B:158.

48:173 Literature and the Film 3 s.h.
Same as 8:173, 36B:155.

48:174 Byzantine and Post Classical Studies I arr.

48:176 Proseminar in Cinema and Culture 1-2 s.h.
Research and discussion of the Institute for Cinema and Culture symposium topic. Same as 36B:176.

48:177 Literature and Art 3 s.h.
Same as 8:177.

48:190 Augustine to Boccaccio 3 s.h.
Same as 8:190.

48:191 International Literature Today 1,3 s.h.
Same as 8:191.

48:192 Dante and Romance Poetry 3 s.h.
Same as 8:192.

48:199 Individual Study arr.
For advanced B.A. candidates with international and comparative literary projects, and for M.A. candidates in comparative literature.

48:200 Comparative Approaches I 1 s.h.
Introduction to theory and method of comparative literary studies, including translation theory, comparative aesthetics, and various theories of literature.

48:211 Comparative Stylistics 3 s.h.
Same as 9:210.

48:217 Introduction to Contemporary Literary Theory 3 s.h.
Major currents in contemporary literary theory and how these theories construct the literary text: structuralist, semiotic, psychoanalytic, Marxist, reader response, and Derridian criticism. Same as 35:281, 8:277.

48:260 Translation Workshop arr.
Prerequisites: at least one classical or modern foreign language and consent of instructor. Same as 8W:260.

48:261 History of Criticism: Plato to 1700 3 s.h.
Theory of literature; emphasis on philosophical implications of literary theory from classical antiquity through the Renaissance and neoclassical Europe to the age of romanticism. Same as 8:261, 14:261, 49:417.

48:262 History of Criticism: 1700-1950 3 s.h.
Theory of literature from neoclassicism to the mid-twentieth century. Same as 8:262, 49:418.

48:263 Issues in Contemporary Literary Criticism 3 s.h.
Same as 8:263.

48:267 Fifteenth-Century Literature 3 s.h.
Same as 8:217.

48:276 Narrative Modes 3 s.h.
Same as 9:265, 36B:276.

48:284 Types of Modern Criticism 3 s.h.
Selected topics in recent European and American criticism. Same as 8:284, 35:284.

48:314 Postmodern Studies 3 s.h.
Same as 8:314.

48:373 European Renaissance 3 s.h.
Literature of the Renaissance, emphasizing genre and theme. Same as 8:373.

48:380 Intellectual Backgrounds of Literary Periods 3 s.h.
Examinations of the historical, political, aesthetic, and other backgrounds of a period in relationship to literary texts. Same as 8:380.

48:382 Literary Genres and Modes 3 s.h.
Same as 8:382.

48:383 Patterns of Myth and Literary Forms 3 s.h.
Definitions, methods, and theories involved in relating myths and mythic thought to literary texts and practice; readings (Frye, Barthes, Lévi-Strauss, Freud) bear upon the criticism and interpretation of literary texts.

48:404 Seminar: Medieval and Renaissance Literature arr.
Comparative problems in Medieval and Renaissance literature; different topics each year.

48:409 Special Projects arr.
For doctoral candidates.

48:410 Thesis arr.

48:460 Seminar: Problems in Aesthetics and Literary Theory arr.
Same as 8:460.

48:471 Seminar: Literature and Other Arts arr.

48:472 Seminar: Literature and Communication arr.
Same as 8:472.

COMPUTER SCIENCE

See "Division of Mathematical Sciences."

DANCE

Chair: Francoise Martinet
Associate professors: Alicia Brown, David Berkey, Helen Chadima, Francoise Martinet
Assistant professor: Susan Dickson
Visiting assistant professors: Linda Crist, Lan-lan King
Assistant in instruction: Gene Gebauer
Undergraduate degrees offered: B.A., B.F.A. in Dance
Graduate degree offered: M.F.A. in Dance

Undergraduate Programs

The undergraduate major in dance provides a liberal arts education and thorough preparation for careers in professional dancing, choreography, and education as well as for graduate studies. The program offers many opportunities for performance and choreography as well as an abundance of master classes with guest teachers and touring companies. Since 1986, the dance department's touring company, "Dancers To Go," has provided an opportunity for the best qualified students to perform in Iowa and surrounding states.

Bachelor of Arts

The B.A. degree program in dance is designed for students who want a strong liberal arts education background and solid undergraduate dance preparation. It stresses performance, choreography, and teaching, as well as theory courses such as Labanotation, dance history, dance theory, and dance production. Students in the program must complete 50 semester hours of credit in dance courses.

Required Courses

Dance Theory

137:19 Introduction to Dance	1 s.h.
137:26 Dance Production	3 s.h.
137:29 Rhythmic Analysis of Dance	2 s.h.
137:114 Dance History: From Primitive Through the Nineteenth Century	3 s.h.
137:115 Twentieth-Century Dance	3 s.h.
137:177 Beginning Labanotation	3 s.h.

Studio (Nontechnique)

137:73 Composition I	2 s.h.
137:74 Composition II	2 s.h.
137:173 Composition III	arr.
137:174 Composition IV	arr.

Dance Electives

Seven semester hours from the following:

137:91 Independent Study	arr.
137:92 Independent Choreography	arr.
137:111 Methods and Materials of Teaching Children's Dance	2-3 s.h.
137:113 Ballet Pointe	1 s.h.
137:117 Ballet Pedagogy	3 s.h.
137:118 Advanced Ballet Pedagogy	3 s.h.
137:122 Workshop: Artist-in-Residence	1-4 s.h.
137:130 Improvisation	1 s.h.
137:138 Teaching of Modern Dance	3 s.h.
137:141 Repertory Dance Company	arr.
137:170 Readings in Dance	arr.
137:175 Dance Theory	3 s.h.
137:176 Criticism of Dance	3 s.h.
137:178 Intermediate Labanotation	3 s.h.
137:181 Dance Performance	4 s.h.

Studio Technique

Twenty semester hours from the following:

137:5 Tap	2 s.h.
137:6 Continuing Tap	2 s.h.
137:8 Major Modern Dance I	1-2 s.h.
137:10 Beginning Ballet	2 s.h.
137:11 Continuing Ballet	2 s.h.
137:12 Low Intermediate Ballet	2 s.h.
137:14 Intensive Training for the Male Dancer	2 s.h.
137:15 Major Ballet I	1-2 s.h.
137:20 Beginning Jazz	2 s.h.
137:21 Continuing Jazz	2 s.h.
137:22 Low Intermediate Jazz	2 s.h.
137:30 Beginning Modern Dance	2 s.h.
137:31 Continuing Modern Dance	2 s.h.
137:32 Low Intermediate Modern Dance	2 s.h.
137:107 Major Modern Dance II	1-3 s.h.
137:108 Major Modern Dance III	1-3 s.h.
137:109 Major Ballet II	1-3 s.h.
137:110 Major Ballet III	1-3 s.h.

Nondepartmental

28:80 Human Anatomy	3 s.h.
28:81 Kinesiology	3 s.h.
25:165 Opera Dance Theatre Production	8 s.h.

Bachelor of Fine Arts

In contrast to the B.A. degree in dance, the B.F.A. degree requires 12 more semester hours in studio courses and emphasizes performance and choreography at the undergraduate level. Students may be admitted to the B.F.A. degree program after they have completed a minimum of 30 semester hours at The University of Iowa. The dance department faculty admits to the B.F.A. degree curriculum only those students who have achieved the equivalent of "Majors II" technique level and show academic and professional promise.

Students seeking the B.F.A. in dance may waive 3 semester hours of the General Education Requirement in natural sciences (nonlab) and 4 semester hours of the General Education Requirement in physical education.

Required Courses

Dance Theory

137:19 Introduction to Dance	1 s.h.
137:26 Dance Production	3 s.h.
137:29 Rhythmic Analysis of Dance	2 s.h.
137:114 Dance History: From Primitive Through the Nineteenth Century	3 s.h.
137:115 Twentieth-Century Dance	3 s.h.
137:177 Beginning Labanotation	3 s.h.

Studio (Nontechnique)

137:73 Composition I	2 s.h.
137:74 Composition II	2 s.h.
137:173 Composition III	arr.
137:174 Composition IV	arr.
137:181 Dance Performance	4 s.h.

Dance Electives

Four semester hours from dance electives listed under B.A. requirements.

Studio Technique

Thirty-one semester hours from the following (courses may be repeated):

137:8 Major Modern Dance I	1-2 s.h.
137:15 Major Ballet I	1-2 s.h.
137:107 Major Modern Dance II	1-3 s.h.
137:108 Major Modern Dance III	1-3 s.h.
137:109 Major Ballet II	1-3 s.h.
137:110 Major Ballet III	1-3 s.h.

Nondepartmental

28:80 Human Anatomy	3 s.h.
28:81 Kinesiology	3 s.h.
25:165 Opera Dance Theatre Production	8 s.h.
Electives: studio courses in art, music, theater, English, or broadcasting and film	6 s.h.

Minor

A minor in dance requires 15 semester hours of credit in dance department

courses with a minimum grade-point average of 2.00, at least 12 semester hours must be in University of Iowa courses numbered 137:100 and above.

Honors Program

The 6- to 8-semester-hour honors program is designed to serve and recognize outstanding students in the areas of performance and special projects. Honors students must maintain a 3.20 grade-point average during their junior and senior years. All honors projects must be approved by the dance department faculty. Students must be members of the College of Liberal Arts Honors Program to graduate with honors in Dance.

Graduate Program

Master of Fine Arts

Students who demonstrate exceptional ability in dance technique and choreography may apply for admission to the M.F.A. degree program. Admission is based on an interview, a teaching and technique audition, review of videotaped choreographic work, and letters of recommendation. The M.F.A. degree program is designed to be completed in six semesters in residence, but students who have completed some of the prerequisites before entering the program may complete it in five semesters.

Prerequisites

Advanced technique	
Rhythmic analysis	2 s.h.
Dance production	3 s.h.
Dance history	6 s.h.
Anatomy	3 s.h.
Kinesiology	3 s.h.
Beginning Labanotation	3 s.h.
Composition I-IV	8 s.h.

Required Courses

Dance Theory

28:216 Physiological Responses to Exercise and Training	3 s.h.
137:117 Ballet Pedagogy	3 s.h.
137:138 Teaching of Modern Dance	3 s.h.
137:175 Dance Theory	3 s.h.
137:181 Dance Performance	0-1 s.h.
137:191 Independent Choreography	2 s.h.
137:204 Seminar: Dance	2 s.h.
137:401 Thesis	3 s.h.
137:192 Graduate Production Practicum	1 s.h.

Dance Technique

Twenty-two semester hours from the following:

137:107 Major Modern Dance II	1-3 s.h.
137:108 Major Modern Dance III	1-3 s.h.
137:109 Major Ballet II	1-3 s.h.
137:110 Major Ballet III	1-3 s.h.

Required Non-Dance Courses

A total of 8 semester hours at the 100 level or above must be earned from courses other than those with a 137 prefix. These courses, selected by the student and approved by the student's adviser, usually are from the disciplines of art and art history, music, theater, broadcasting and film, physical education, and English.

All M.F.A. candidates must take both a modern dance and a ballet technique course during their first two semesters in residence at The University of Iowa.

Electives

Departmental or nondepartmental 6 s.h.

Facilities

The dance department has some of the finest facilities in the country: six technique studios, two classrooms, video viewing and Labanotation computer rooms, a library, and its own performance theater space for informal concerts. In addition, Hancher Auditorium is available for formal concerts.

Courses

Primarily for Undergraduates

137:000 Cooperative Education Internship 0 s.h.

137:5 Tap 1-2 s.h.
Intended for beginners. May be repeated.

137:6 Continuing Tap 1-2 s.h.
Continuation of 137:5. May be repeated.

137:7 High Intermediate Tap 2 s.h.
High intermediate level. May be repeated.

137:8 Major Modern Dance I 1-2 s.h.
Intermediate level. May be repeated.

137:10 Beginning Ballet 1-2 s.h.
Intended for beginners. May be repeated.

137:11 Continuing Ballet 1-2 s.h.
Continuation of 137:10. May be repeated.

137:12 Low Intermediate Ballet 1-2 s.h.
Low intermediate level. May be repeated.

137:14 Intensive Training for the Male Dancer 2 s.h.
Beginning course in classical ballet. Open only to males. May be repeated.

137:15 Major Ballet I 1-2 s.h.
Intermediate level. May be repeated.

137:19 Introduction to Dance 1 s.h.
Survey.

137:20 Beginning Jazz 1-2 s.h.
Intended for beginners. May be repeated.

137:21 Continuing Jazz 1-2 s.h.
Continuation of 137:20. May be repeated.

137:22 Low Intermediate Jazz 1-2 s.h.
Low intermediate level. May be repeated.

137:26 Dance Production 3 s.h.
Survey encompassing aspects of dance production—scenic design, costuming, lighting, audio/video, publicity.

137:29 Rhythmic Analysis of Dance 2 s.h.
Rhythmic form and its relationship to dance.

137:30 Beginning Modern Dance 1-2 s.h.
Intended for beginners. May be repeated.

137:31 Continuing Modern Dance 1-2 s.h.
Continuation of 137:30. May be repeated.

137:32 Low Intermediate Modern Dance 1-2 s.h.
Low intermediate level. May be repeated.

137:40 Art of Dance in Contemporary Society 3 s.h.
Dance styles and their relationship to societal developments; dance as an expression of the human condition; choreographers and artists; special relationships of dance to the other arts; historical perspective; form and content. GER: humanities.

137:73 Composition I 2 s.h.
Introduction to elementary skills used to explore the choreographic process and form short dance works.

137:74 Composition II 2 s.h.
Continuation of 137:73.

137:91 Independent Study arr.
Not open to freshmen. Consent of instructor required.

137:92 Independent Choreography arr.
Consent of instructor required.

For Undergraduates and Graduates

137:107 Major Modern Dance II 1-3 s.h.
High intermediate level. May be repeated.

137:108 Major Modern Dance III 1-3 s.h.
Advanced level; intended as a preparation for entrance into the professional dance world. May be repeated.

137:109 Major Ballet II 1-3 s.h.
High intermediate level. May be repeated.

137:110 Major Ballet III 1-3 s.h.
Advanced level; intended as a preparation for entrance into the professional dance world. May be repeated.

137:111 Methods and Materials of Teaching Children's Dance 2-3 s.h.
Methods and materials for presenting movement experiences to the elementary school child. Same as 7E:125.

137:113 Ballet Pointe 1-2 s.h.
Level based on students' needs. May be repeated.

137:114 Dance History: From Primitive Through the Nineteenth Century 3 s.h.
Evolution of dance from primitive ritual to the end of the nineteenth century; emphasis on the development of dance as a theatrical art; students learn dances from each of the periods covered.

137:115 Twentieth-Century Dance 3 s.h.
Brief history of dance in America; focus on developments in dance in the twentieth century; panorama of changing styles in ballet and modern dance, with emphasis on American influences.

137:117 Ballet Pedagogy 3 s.h.
Methods and materials of teaching beginning ballet.

137:118 Advanced Ballet Pedagogy 3 s.h.
Methods and materials of teaching intermediate and advanced ballet.

137:122 Workshop: Artist-in-Residence 1-4 s.h.

137:130 Improvisation 1-2 s.h.
Development of the ability to dance and compose extemporaneously within specific guidelines.

137:138 Teaching of Modern Dance 3 s.h.
Methods and materials of teaching modern dance.

137:140 Honors Project in Dance arr.
May be repeated.

137:141 Repertory Dance Company arr.
Open only to members of the University's touring dance company. May be repeated.

137:149 Honors Studies in Dance arr.

137:170 Readings in Dance arr.
Consent of instructor required.

137:171 Dance Company Class arr.

137:173 Composition III arr.
Third-semester choreography; focus on methods of developing narrative themes; time lines, Delsartian theory,

psychological implications of movement invention; primarily activity-oriented.

137:174 Composition IV arr.
Continuation of 137:173.

137:175 Dance Theory 3 s.h.
Aesthetics applied to dance; artistic aims and philosophies of dance.

137:176 Criticism of Dance 3 s.h.
Survey of the writings of dance critics from the eighteenth century to the present; practicum in writing dance criticism. Prerequisites: 137:114, 137:115, and 137:175.

137:177 Beginning Labanotation 3 s.h.
Theory and practice of Laban's principles of movement notation.

137:178 Intermediate Labanotation 3 s.h.
Continuation of 137:177.

137:181 Dance Performance 0-1 s.h.
Rehearsals and performances; program auditions conducted throughout the academic year. May be repeated.

137:182 Dance Company Class 1-2 s.h.

137:191 Independent Choreography arr.

Primarily for Graduates

137:192 Graduate Production Practicum 1 s.h.
Dance production laboratory: scenery and costume design, lighting, audio/video, and publicity.

137:201 Problems in Dance arr.
Consent of instructor required.

137:204 Seminar: Dance 2 s.h.
Survey of problems and opportunities in the dance world.

137:401 Thesis arr.

DENTAL HYGIENE

See "College of Dentistry."

ECONOMICS

Chair: George R. Neumann
Professors: William Albrecht, George Daly, Andrew Daughety, Benjamin Eden, Gary Fethke, Robert Forsythe, John Fuller, Joel Horowitz, Hyman Joseph, John Kennan, Donald McCloskey, Forrest Nelson, George Neumann, Gerald Nordquist, Thomas Pogue, Jennifer Reinganum, N.E. Savin, Larry Sgontz, Calvin Siebert, S.Y. Wu
Professor emeritus: Anthony Costantino
Associate professors: Michael Balch, Raymond Riezman, John Solow, Charles Whiteman
Assistant professors: Andreas Blume, Satyajit Chatterjee, Dean Corbae, Beth Ingram, Yong-Gwan Kim, Narayana Kocherlakota, Barbara McCutcheon, Robert Tamura
Adjunct professor: J. Richard Zecher
Undergraduate degrees offered: B.A., B.S., B.B.A. in Economics
Graduate degrees offered: M.A., Ph.D. in Economics

Economics is concerned primarily with analysis and description of the production, distribution, and consumption of goods and services in society. It involves the systematic study of topics such as wealth and poverty, money and banking, income and consumption, government expenditures and taxation, prosperity and depression, inflation and unemployment, big business and labor unions, and hundreds of other matters that intimately affect the way people live.

The purpose of studying economics is to develop an understanding of how complex economic systems work and to acquire training in the methods of economic analysis, which can be applied to a wide range of economic problems. The department offers courses to meet the needs of the nonmajor as well as the major.

Undergraduate Programs

The baccalaureate programs in economics provide an excellent educational background for a variety of positions in business and government. Graduates find employment in banking, financial institutions, industrial firms, and trade organizations, and in federal, state, and local government agencies dealing with economic policy, regulation, and analysis. Economics also is regarded as excellent preparation for law and for graduate study in fields such as business management, public administration, health and hospital administration, urban and regional planning, transportation, journalism, political science, and statistics.

The department offers three undergraduate degrees—the Bachelor of Science (B.S.) and Bachelor of Arts (B.A.) in the College of Liberal Arts, and the Bachelor of Business Administration (B.B.A.) in the College of Business Administration.

The B.A. and B.B.A. have similar major requirements, but their college requirements differ. The B.B.A. program is designed to provide a background in the business fields of accounting, finance, marketing, business law, and management. The B.S. program is designed to prepare the student for graduate work in economics or related business and technical fields. The B.A. program is designed for students seeking a less technical liberal arts background.

Bachelor of Arts

These are the requirements for the B.A. with a major in economics.

22M:25 Calculus I
and
22S:8 Quantitative Methods II

6E:85 Economic Statistics
or
6K:71 Statistical Analysis

Twenty semester hours of credit in 100-level economics courses, including 6E:105 Macroeconomics.

Prerequisite for 6E:103 Microeconomics and 6E:105 Macroeconomics are grades of C or higher in 6E:001 and 6E:002, or consent of the undergraduate director.

Most 100-level courses in economics have as prerequisites both 6E:1 Principles of Microeconomics and 6E:2 Principles of Macroeconomics, or senior standing.

Credit gained in 6E:100 Price, Employment, and Production Theory cannot be counted toward the 20 semester hours of 100-level economics course credit required for the B.A. degree.

Bachelor of Science

The B.S. program in economics requires these courses and electives.

22M:25-26 Calculus I-II
22S:120 Probability and Statistics
Twenty semester hours of credit in 100-level economics courses, including 6E:105 Macroeconomics, and 6E:184 Introduction to Econometrics.

Credit earned in 6E:100 Price, Employment, and Production Theory cannot be counted toward the 20 semester hours of 100-level course credit.

Minor

The minor in economics requires at least 15 semester hours of credit in economics with a minimum grade-point average of 2.00. Twelve of these semester hours must be taken at The University of Iowa in courses numbered 6E:100 and above.

Honors

Students working toward the B.A. or B.S. degree with an economics major are encouraged to take part in the honors program in economics. The honors program offers high-achieving students an opportunity to pursue special research interests.

To enter this program, students should have completed both 6E:103 Microeconomics and 6E:105 Macroeconomics, and must have an overall grade-point average of at least 3.20. Honors students enroll in an honors seminar, write an honors thesis, and take an oral examination on their honors work. To graduate with honors, students must maintain an overall 3.20 grade-point average. Interested students should consult the department honors adviser before the second semester of the junior year.

Bachelor of Business Administration

The program for the B.B.A. degree is described in the "College of Business Administration" section of the *Catalog*.

Course Work for Nonmajors

For nonmajors, departmental courses 6E:1 Principles of Microeconomics and 6E:2 Principles of Macroeconomics satisfy the College of Liberal Arts General Education Requirement in social sciences and provide an introduction to specialized topics of upper-division courses. Students with limited exposure to economics may examine the economic factors of current public policy issues in 6E:7 Contemporary Economic Problems and Policy.

Course work in economics can be related to majors in many other fields—for example, history majors might take 6E:151 American Economic History and 6E:103 Microeconomics; political science majors could elect 6E:119 Economics of the Government Sector and 6E:141 Economics of American Industries.

A number of students combine related interests by pursuing double majors in economics and in fields such as computer science, geography, history, mathematics, political science, sociology, or statistics.

Graduate Program

The department offers the Masters of Arts (M.A.) and the Doctor of Philosophy (Ph.D.) degrees. The doctoral program has a theory and quantitative core enhanced by a set of field courses and is designed to provide students with rigorous training in microeconomic theory, macroeconomic theory, mathematical economics, and econometrics. In addition to taking the core area, students select a major area for intensive study and specialization. The usual time required to complete the Ph.D. program is four years.

The Master of Arts is offered only to students working toward a Ph.D. degree or to those who earn, through the College of Business Administration, a joint M.A. with geography or a joint M.A.-J.D. with law.

See the "College of Business Administration" section of the *Catalog* for details on Ph.D. and joint M.A. program requirements.

Special Seminar

Each year the department offers a seminar program that brings eminent economists from other universities and government to The University of Iowa campus. Presentations by faculty and student members of the department also are featured.

Courses

Primarily for Undergraduates

Note: 6E:1 and 6E:2 may be taken in either order or they may be taken simultaneously; they satisfy the College of Liberal Arts General Education Requirement in social sciences for nonmajors.

6E:000 Cooperative Education Internship **0 s.h.**

6E:1 Principles of Microeconomics **3-4 s.h.**
Organization and workings of modern economic systems; role of markets, prices, and competition in the promotion of economic welfare; alternative systems; international trade. GER: social sciences (except B.B.A. students). Prerequisite: satisfaction of University rhetoric requirement or 12 s.h. of other UI course work.

6E:2 Principles of Macroeconomics **3-4 s.h.**
National income and output, employment and prices; money and credit; government finance; monetary and fiscal policy; economic growth and development; international finance. GER: social sciences (except B.B.A. students). Prerequisite: satisfaction of University rhetoric requirement or 12 s.h. of other UI course work.

6E:7 Contemporary Economic Problems and Policy **2-3 s.h.**

6E:85 Economic Statistics **3 s.h.**
Application of statistical methods to problems in economics; topics include regression analysis, contingency tables and goodness of fit tests, simple time series modeling, presentation of economic statistics, index number construction, and survey and census methods. Prerequisites: 6E:1, 6E:2, and 22S:8.

6E:99 Internship **arr.**
Open only to students participating in the Washington Center for Learning Alternatives or other approved internship programs. Offered only satisfactory-fail. Consent of instructor required.

6E:100 Price Employment and Production Theory **3-4 s.h.**

6E:103 Microeconomics **3 s.h.**
Economic theory of consumer behavior, producer behavior, and role of markets in coordinating economic decisions; conditions for efficient resource allocation by market mechanisms. Prerequisites: grade of C or higher in 6E:1 and 6E:2, or consent of undergraduate director.

6E:105 Macroeconomics **3 s.h.**
Measurement of national product, unemployment, and inflation; determination of national income and the price level; analysis of the use of stabilization policies; explanation of the dynamics of inflation and the problem of stagflation. Prerequisites: grade of C of higher in 6E:1 and 6E:2, or consent of undergraduate director.

6E:111 Labor Economics **3 s.h.**
Microeconomic analysis of labor markets and related institutions; labor supply decisions made by workers, labor demand decisions made by firms, and resulting patterns of employment and wages; economic analysis of unions; causes of unemployment. Prerequisite: 6E:1 or consent of instructor.

6E:113 Health Economics **3 s.h.**
Structure of America's medical care industry and applications of economic analysis to its problems of production, pricing, and distribution; impact of insurance and the role of private and governmental planning agencies. Prerequisites: 6E:1 and 6E:2, or consent of instructor.

6E:117 Money and Banking **3 s.h.**
Monetary institutions; theory, practice, and policy with respect to the role of money in the determination of income, employment, and prices in domestic and world economy. Prerequisites: 6E:1 and 6E:2, or senior standing.

6E:119 Economics of the Government Sector **3 s.h.**
Economic functions of government in modern economies; economic decision making in government; budgetary processes; effects of government expenditures and taxation on allocation of resources, distribution of income, economic growth, and stability. Prerequisites: 6E:1 and 6E:2, or consent of instructor.

6E:123 Political Economy of the Military-Industrial Complex **3 s.h.**
Examines recent literature on the theory of the "military-industrial complex," contrasts these views with those of the classical school on national security affairs; traces historical development of the "complex," attempts to relate it to causes and consequences in political, economic, and social dimensions. Prerequisites: 6E:1 and 6E:2, or senior standing.

6E:125 International Economics **3 s.h.**
Foreign exchange and balance of payments; international monetary arrangements and policy; theory of international trade; role of tariffs and restrictions in international trade. Prerequisites: 6E:1 and 6E:2, or senior standing.

6E:127 Natural Resources in the World Economy: Control and Conflict **2-3 s.h.**
Economic issues connected with the "new scarcity" in natural resources; theory of natural resources production; natural resources and economic growth; common property resources; market structure and strategy; supply and demand outlook; role of technological advancement, actual and potential conflict among nations; policy issues. Prerequisites: 6E:1 and 6E:2, or senior standing.

6E:129 Economic Development: Underdeveloped Areas **3 s.h.**
The problem of underdevelopment in Third World countries; examination of theories and policies of economic development. Prerequisites: 6E:1 and 6E:2, or senior standing.

6E:131 Agricultural and Food Policy **3 s.h.**
Examination of major elements in the farm policy debate and agricultural policy formulation; analysis of agricultural production, markets and market structure, government commodity programs, farm income and regional farm structure, world food policy, and domestic agricultural policy. Prerequisites: 6E:1 and 6E:2, or senior standing.

6E:133 Environmental Economics **3 s.h.**
Economic analysis of current environmental and resource use problems; policies for environmental protection. Prerequisites: 6E:1 and 6E:2, or senior standing, or consent of instructor.

6E:135 Regional and Urban Economics **3 s.h.**
Theory of location and regional development; factors influencing location of production, city location and hierarchies, land-use patterns, and measurement and change in regional economic activity; public policy issues in regional and urban development. Prerequisites: 6E:1 and 6E:2, or senior standing.

6E:141 Economics of American Industries **3 s.h.**
Structural evolution of American industries, imperfect competition and resource allocation; development of public policies toward monopoly practices; studies of selected industries. Prerequisites: 6E:1 and 6E:2, or senior standing.

6E:145 Introduction to Transportation **3 s.h.**
Same as 102:133, 44:133.

6E:150 Introduction to Economic History **3 s.h.**
Western economic development from antiquity to the present, with equal emphasis on the centuries before and after A.D. 1700; topics include the evolution of population, technology, business organization, production, and trade; the dynamics of economic systems; methodology. Prerequisite: 6E:1 or equivalent.

6E:151 American Economic History **3 s.h.**
Analysis based on theoretical model of how the American economy has developed; special emphasis on demographic factors, role of government, capital markets, structural change. Prerequisites: 6E:1 and 6E:2, or senior standing. Same as 16A:144.

6E:152 British Economic History **3 s.h.**
Topics in eight centuries of British history from economic viewpoint; open fields, enclosures, the Industrial Revolution, industrial decline. Prerequisite: 6E:1 or 6E:2 or equivalent.

6E:161 History of Economic Thought **2-3 s.h.**

6E:164 The Soviet Economy **3 s.h.**
Organization and operation of the Soviet-type economy, including historical and ideological influences; detailed study of central planning, industrial management, labor, agriculture, technology, trade, and living conditions in the USSR; critique of Soviet economic performance, Soviet economic reforms compared to reforms in other socialist countries; prospects for increased integration in the world economy. Prerequisites: 6E:1 and 6E:2, or senior standing.

6E:165 Modern Economies of East Asia **3 s.h.**
Industrial and rapidly industrializing economies in East Asia (Japan, South Korea, Taiwan, Hong Kong, Singapore, and the Peoples' Republic of China); comparative resource endowments, economic systems, and economic policies; patterns of investment and technological change; labor-management relations and living conditions; international economic relations; current problems and future prospects. Prerequisites: 6E:1 and 6E:2, or senior standing.

6E:166 The Political Economy of Socialism **3 s.h.**
Evolution of socialist economic thought; contemporary models of socialist economy; existing socialist systems (USSR, Eastern Europe, China, Cuba); recent reforms and contrasts with welfare capitalism. Prerequisites: 6E:1 and 6E:2, or senior standing.

6E:169 Problems of the World Monetary Order **3 s.h.**
Balance of payments, foreign exchange, and capital markets; evaluation of the world monetary system from Bretton Woods to the present; major global monetary problems. Not open to economics majors or minors. Prerequisite: junior or senior standing.

6E:171 Antitrust: Legal and Economic Analysis **3 s.h.**
Current federal antitrust policy; topics include federal merger policy, monopolization, predatory pricing, collusion, vertical restrictions and resale price

maintenance, and enforcement; reading from case law as well as economics literature. Prerequisite: 91:208 or 6E:103 or consent of instructor. Same as 91:201.

6E:172 Law and Economics 3 s.h.
Introduction to the field of law and economics; law examined through analytic tools of microeconomics; impact of legal rules on resource allocation, risk bearing and distribution of economic well-being. Prerequisite: 6E:103 or consent of instructor. Same as 91:295.

6E:173 Advanced International Economics 3 s.h.
Neoclassical model of international trade, theory of comparative advantage, role of trade barriers, balance of payments, foreign exchange, macroeconomic policy in an open economy. Prerequisites: 6E:103 and 6E:105, or graduate standing.

6E:174 Monetary Economics 3 s.h.
Demand for and supply of money; role of money in the economy; empirical studies of the impact of money; problems with monetary control. Prerequisite: 6E:105 or 6E:117 or equivalent, or consent of instructor.

6E:175 Economic Analysis of Labor Markets 3 s.h.
Nontechnical introduction to topics that labor economists currently are studying: the nature and causes of unemployment; long-term employment arrangements; economic analysis of unions, bargaining, arbitration, and strikes. Prerequisites: 6E:103, elementary calculus, and statistics.

6E:177 Industrial Organization 3 s.h.
Survey of market structure in the United States; public policy issues in industrial organization; theories of imperfect competition; appraisal of antitrust policies and government regulation of business. Prerequisite: 6E:103.

6E:180 Mathematics for Economists I 3 s.h.
Matrix algebra, determinants, linear systems of equations; review of single-variable differential calculus, calculus for functions of several variables; Langrangian and second-order conditions for the maximization problem with single equation constraint. Offered fall semesters. Prerequisite: one year of calculus or consent of instructor.

6E:181 Mathematics for Economists II 3 s.h.
Introduction to set theory, equivalence and order relations; introductory linear algebra and real analysis; metric and topological spaces; applications drawn from economics. Offered spring semesters. Prerequisite: 6E:180 or one year of calculus and matrix algebra.

6E:184 Introduction to Econometrics 3 s.h.
Single equation linear statistical models, estimation and hypothesis testing; serial correlation, heteroscedasticity, and generalized least squares estimation; specification analysis; errors in variables; introduction to simultaneous equation models; emphasis on interpretation and application of econometric models and methods. Prerequisite: 22S:120 or equivalent.

6E:185 Introduction to Applied Econometrics 3 s.h.
Substantive problems from economics, business, and social sciences examined in detail to illustrate methods and issues in modeling, data collection, and inference; simple and multiple linear regression, time series, logistic regression, systems of equations, nonlinear regression; extensive use of computers. Prerequisite: 6E:184 or equivalent.

For Advanced Undergraduates

6E:197 Honors Seminar arr.
Consent of instructor required.

6E:198 Senior Thesis in Economics arr.
Primarily for honors students. Consent of instructor required.

6E:199 Readings and Independent Study in Economics arr.
Consent of instructor required.

Primarily for Graduates

With consent of the department chair, qualified undergraduate students may enroll in courses listed for graduate students.

6E:202 Price Theory 3 s.h.
Theory of consumer, theory of firm; theory of markets; general equilibrium and welfare economics.

6E:203 Microeconomics I 3 s.h.
Price theory; strong emphasis on formulation and solving of problems, development of basic economic intuition; producer and consumer behavior, theory of competitive and noncompetitive markets, and welfare economics. Offered fall semesters. Consent of instructor required.

6E:204 Macroeconomics I 3 s.h.
Aggregate economics statistics; comparative static analysis of neoclassical, neo-Keynesian, and monetarist macroeconomic models; sectoral demands, dynamics of inflationary expectations and employment; economic growth. Offered fall semesters. Consent of instructor required.

6E:205 Microeconomics II 3 s.h.
Calculus treatment of the neoclassical paradigm; the nature of its axioms and its essential conclusions; limitations of the paradigm and some orientations to alternative theories. Offered spring semesters. Prerequisite: 6E:203 or 6E:180 or one year of calculus.

6E:206 Macroeconomics II 3 s.h.
Further analysis of comparative static and dynamic macroeconomic models; stochastic macroeconomics; role of stabilization policies; equilibrium business cycle theory. Offered spring semesters. Prerequisite: 6E:204 or consent of instructor.

6E:211 Mathematical Economics I 3 s.h.
Introduction to convex analysis in economic theory; ordinal and cardinal preference relations; quasiconcave and concave numerical representations; separation principle for convex sets; linear programming; concave programming; Brouwer fixed-point theorem and existence of competitive equilibrium. Offered fall semesters. Prerequisites: 6E:205 and 6E:181.

6E:212 Mathematical Economics II 3 s.h.
Theories of n-person games, noncooperative or cooperative, with applications to general economic equilibrium analysis. Prerequisite: 6E:211.

6E:217 The Economics of Uncertainty 2-6 s.h.
The nature of information and informational equilibrium; topics in risk and risk aversion; temporal resolution of uncertainty. Prerequisite: 6E:211.

6E:221 Econometrics 3 s.h.
Statistical inference in single- and multiple-equation stochastic models, models with nonindependent or nonidentically distributed error structure, and dynamic models; OLS, GLS, IV, and ML estimation; introduction to asymptotic distribution theory; exact and asymptotic hypothesis tests. Prerequisite: 22S:154 or equivalent.

6E:222 Applied Econometrics 3 s.h.
Empirical problems drawn from substantive areas in economics demonstrate application of econometric techniques; models and methods include multiple linear regression, nonlinear regression, maximum likelihood, hazard functions, univariate and multivariate time series, and flexible functional forms. Prerequisite: 6E:221.

6E:223 Econometric Theory I 3 s.h.
Rigorous treatment of statistical theory underlying econometric inference; emphasis on estimation and hypothesis testing in linear models. Prerequisite: 6E:221.

6E:224 Econometric Theory II 3 s.h.
Continuation of 6E:223; emphasis on estimation and hypothesis testing in nonlinear models. Prerequisite: 6E:223.

6E:225 Topics in Econometrics 3 s.h.
Advanced econometric theory and methods; topic varies with interests of students and instructor. Prerequisite: 6E:224 or consent of instructor.

6E:226 Travel Demand Modeling 3 s.h.
Mathematical and statistical background for travel demand modeling; choice theories; random utility models; econometric methods for the multinomial logit and related models; applications of random utility models to travel demand forecasting; demand/performance equilibration. Prerequisite: 6E:184 or 6E:221. Same as 44:236.

6E:231 Economic Development and Policy Alternatives 3 s.h.
Process of economic development with emphasis on theories of development and policy alternatives. Consent of instructor required.

6E:234 Development Policy and Planning in the Third World 3 s.h.
Cross-cultural and interdisciplinary analysis of problems associated with urbanization and development in the developing nations. Same as 113:275, 44:275, 34:275, 102:275, 42:275, 7F:275.

6E:235 International Trade Theory 3 s.h.
Theory of foreign trade; tariff theory and policy; other selected topics. Consent of instructor required.

6E:236 International Monetary Economics 3 s.h.
Theory of foreign exchange; balance of payments adjustment; exchange controls; international investment; macropolicy in an open economy. Consent of instructor required.

6E:241 Macroeconomics III 2-6 s.h.
Organized survey of current research in macroeconomics; designed to help advanced students identify and develop their own topics for research, emphasizing both theoretical and empirical analysis. Prerequisites: 6E:205 and 6E:221.

6E:245 Monetary Theory 2-3 s.h.
Optimum quantity of money; models of monetary growth; overlapping generation models with applications to monetary economies; determinants of interest rates; effects of anticipated and unanticipated money supply changes; empirical estimates of the impact of money. Consent of instructor required.

6E:250 Labor Economics 3 s.h.
Introduction to basic problems and models in labor economics, including intertemporal models of labor markets; uncertainty and labor market activity; retirement decisions, economic theories of fertility; economics of discrimination; models of job search; economic models of unions; bargaining and strikes, public sector labor markets; determinants of the distribution of income; emphasis on empirical verification of theory. Prerequisites: 6E:205, and 6E:221 or 6E:184.

6E:251 Labor Economics 3 s.h.
Detailed review of selected current research topics, with emphasis on prospects for original research; may include life cycle models of labor supply, dynamic labor demand models, compensating wage differentials, labor turnover, cyclical employment fluctuations, aspects of collective bargaining. Prerequisites: 6E:205, and 6E:221 or 6E:184.

6E:263 European Economic History 3 s.h.
European economic growth since the Industrial Revolution; emphasis on population trends and labor force growth, evolution of capital markets, patterns of capital accumulation, resultant rates of economic growth; analyses of technological progress and growth of open economies. Consent of instructor required.

6E:265 History, Thought, and Methodology 2-6 s.h.
Course is divided into three modules: economic modeling in a historic context and topics in economic history; development of economic theory from the classical school to the present; and premises of different methods of modeling economic behavior. Consent of instructor required.

6E:268 History of Economic Thought II 3 s.h.
Development of marginalist, neoclassical, and Keynesian thought; American economic thought including institutional economics; varieties of socialist economies; ultraliberal tradition. Consent of instructor required.

6E:271 Industrial Organization 2-4 s.h.
Theories of the firm, monopolistic competition, oligopoly and workable competition; industrial organization and nature of equilibrium under uncertainty. Prerequisites: 6E:205 and 6E:211.

6E:272 Economics of Organization 2-4 s.h.
Design of industrial organization and incentive mechanisms in achieving efficient allocations; studies of not-for-profit activities and their welfare implications. Prerequisite: 6E:205.

6E:281 Economics of the Government Sector: Taxation 3 s.h.
Role and effects of taxation; effects of major taxes on allocation of resources, distribution of income, and economic growth and stability; debt finance as an alternative to tax finance.

6E:282 Economics of the Government Sector: Expenditures 3 s.h.
Economic functions and effects of government spending; budgetary processes; benefit-cost analysis; theories of bureaucracy; voting models; centralized versus decentralized decision making; intergovernmental fiscal relations.

6E:290 Regional Development: Theory and Policy 3 s.h.
Models of regional growth and development, urbanization and city-size distributions in growth and development, development pole theory, regional equilibrium and disequilibrium analysis, regional economic policy for

development. Prerequisite: 6E:203 or consent of instructor. Same as 44:290, 102:290.

6E:293 Advanced Location Theory **3 s.h.**
Economics of location; location of the firm; transportation cost and location; location-allocation models; spatial price theory. Prerequisite: 6E:202 or 6E:203 or consent of instructor. Same as 44:293.

6E:300 Readings in Economics **arr.**
Consent of instructor required.

6E:301 Thesis in Economics **arr.**
Consent of instructor required.

6E:302 Dissertation Seminar **1-3 s.h.**
Prerequisite: approval of prospectus.

6E:305 Economics Seminar **arr.**

6E:323 Workshop in Applied Econometrics and Statistics **arr.**

Advanced Graduate Seminars

6E:309 Readings in Advanced Economic Theory **3 s.h.**
Unstructured course; seven to ten recent papers, published or unpublished, are selected; discussion of content and subjects related to each paper. Prerequisites: 6E:203 and 6E:205.

6E:310 Seminar in Economic Theory **arr.**
Consent of instructor required.

6E:311 Seminar in Microeconomics **arr.**
Consent of instructor required.

6E:312 Seminar in Macro and Monetary Economics **arr.**
Consent of instructor required.

6E:313 Seminar in Econometrics **arr.**
Consent of instructor required.

6E:321 Workshop in Microeconomics **arr.**
Consent of instructor required.

6E:322 Workshop in Macro and Monetary Economics **arr.**
Consent of instructor required.

EDUCATION

See "College of Education."

ENGLISH

Chair: John Raeburn
Professors: Paul Baender, Marvin Bell, Florence Boos, David S. Chamberlain, Frank Conroy, Archibald C. Coolidge, Stavros Deligiorgis, Carol de Saint Victor, Ed Folsom, Wayne Franklin, Miriam Gilbert, John E. Grant, David Hamilton, N. Katherine Hayles, Ray L. Heffner, John F. Huntley, Robert E. Kelley, Carl H. Klaus, Rudolf E. Kuenzli, William Kupersmith, Valerie Lagorio, Richard Lloyd-Jones, Susan Lohafer, Donald G. Marshall, James Alan McPherson, K.K. Merker, Adalaide Morris, William Murray, Alan F. Nagel, Peter Nazareth, Harry Oster, John Raeburn, Herman Rapaport, Robert F. Sayre, Oliver Steele, Gerald Stern, Albert E. Stone, Darwin Turner, Daniel Weissbort
Professors emeriti: Sven M. Armens, Angelo Bertocci, G. Robert Carlsen, Rhodes Dunlap, Hualing Nieh Engle, Paul Engle, John C. Gerber, W.R. Irwin, Alexander C. Kern, John Leggett, Frederick P.W. McDowell, John C. McGalliard, John C. McLaughlin, William J. Paff, Sherman Paul
Associate professors: Huston Diehl, Paul Diehl, Mary Lou Emery, James Galvin, Jorie Graham, Mae Henderson, Cheryl Herr, Brooks Landon, James Marshall, Fredrick Woodard
Associate professors emeriti: William Clark, Richard Hootman, Robert F. Woerner
Assistant professors: Kathleen Diffley, Barbara Eckstein, John B. Harper, Deborah Laycock, Thomas Lutz, Teresa Mangum, Cleo Martin, Alvin Snider, Jonathan Wilcox
Undergraduate degree offered: B.A. in English
Graduate degrees offered: M.A., M.F.A., Ph.D. in English

The Department of English offers courses in literature, language, and writing, providing opportunities for students to learn information about and methods for understanding literary history, interpretive theory, and the crafts of poetry, fiction, and nonfiction. In addition to providing these essential elements of a liberal education, the department offers courses as background for students who have specialized interests in other fields. It also participates in interdisciplinary programs such as American Studies; African-American World Studies; Comparative Literature; Literature, Science, and the Arts; and Women's Studies.

The English faculty is committed to expanding the traditional canon of literature. Many faculty members devote their attention to the literatures of women, minorities, and non-Western cultures. Some teach and write about literature and culture, supplementing the use of literary text with paintings, photography, music, folklore, film, video, popular literature, and significant texts from many fields, including history, philosophy, physics, psychology, and sociology. The department has a strong and longstanding commitment to the teaching of creative and expository writing.

Although most students in the Ph.D. program are preparing for careers as teachers and scholars and most in the M.F.A. program are preparing for lives as poets and storytellers, the B.A. and M.A. programs provide valuable training for careers in many other fields. Students who have received English degrees from The University of Iowa are now writing for advertising firms, newspapers, and book publishers; teaching in primary and secondary schools; practicing law and medicine; working in business and industry; and participating in state or federal government. As far as possible, each academic program is arranged to meet students' individual needs and objectives.

Undergraduate Programs

The major in English provides students with a solid core of interpretive, analytical, and writing skills rather than a uniform view of any particular literary history or theory. The department's goal is to offer an undergraduate program designed to challenge students, to help them develop essential reasoning and communication skills, and to introduce them to the many pleasures and rewards of the study of artful language.

Bachelor of Arts

A Bachelor of Arts degree with a major in English requires a minimum of 33 semester hours of credit in courses offered by the Department of English, at least 9 of which must come from courses dealing principally with literature written before 1800 and at least 18 of which must be taken in residence at The University of Iowa.

In fulfilling the above requirements, English majors must complete at least:

3 semester hours in readings courses;

3 semester hours in authors courses, in which no more than two authors are studied;

3-4 semester hours in literature and culture courses; and

3 semester hours in cultural study courses.

These requirements apply to all students who declare an English major following the close of the spring 1989 semester. The *Schedule of Courses* for each semester specifies which English department courses fit the above categories. The requirement of at least 9 semester hours focusing on literature written before 1800 may be satisfied by courses that also satisfy other requirements for the major. Only 9 semester hours of creative writing courses may be applied toward the 33 semester-hour total for the major.

Students interested in the English major should consult the director of undergraduate programs in the English department office, 308 English-Philosophy Building. The *Handbook for the Iowa English Major* offers a more detailed view of the requirements, programs, and procedures for the English major. It is available from the director of undergraduate programs.

General Education Waivers for English Majors

Students who declare English majors may count either 8G:1 or an English department readings course in fulfillment of the 8G:1 portion of the General Education Requirement in humanities. No 8G courses can be counted toward the 33 semester hours required for the English major.

Minor

A minor in English requires 15 semester hours of course work in Department of English courses with a grade-point average of 2.00. Twelve of these semester hours should be in advanced courses (8:34 and above) taken at The University of Iowa. Courses approved for the liberal arts General Education Requirements do not count toward the minor in English.

Honors

The English major with honors offers talented students the opportunity to enhance their course of study through

special courses and independent study. Each year the department offers four honors proseminars covering a wide range of historical areas and topics. Students who wish to earn a degree with honors have two options. They may take:

- Three proseminars during the junior and senior years, and then revise the three essays written as seminar papers and, with an introduction, present them as the honors project; or
- Two of the seminars, preferably in the junior year, and then, in the senior year, write an honors thesis under the supervision of a faculty member. A creative thesis is possible under the second option, but only rarely and with permission of the Writers' Workshop.

Students interested in more information should contact the chair or any member of the honors committee. The names of the committee members and their office hours are available in the English department office, 308 English-Philosophy Building. A handout, *Guidelines and Deadlines*, which describes both options for the final project in greater detail and specifies the deadlines for turning in the prospectus and the final honors project, also is available in the English office.

Creative Writing

Many undergraduates come to The University of Iowa because of the excellence of its creative writing program. With the consent of his or her adviser, any student may elect the undergraduate courses in this program. These are 8W:23 Creative Writing, 8W:151 Fiction Writing, and 8W:152 Poetry Writing.

Admission to the undergraduate workshops in fiction and poetry (8W:163 Undergraduate Writers' Workshop: Fiction and 8W:166 Undergraduate Writers' Workshop: Poetry) requires consent of the instructors. Students who wish to take part in these workshops must submit samples of their poetry or fiction to the Writers' Workshop no earlier than a week before registration and no later than the last day of registration.

English and Education

The department offers a flexible undergraduate program for students planning to teach English in elementary and secondary schools. Students who complete this program satisfy the requirements for a general major in English and for teaching certification.

Students who wish to be certified to teach English in Iowa secondary schools should select courses that fulfill the state guidelines for English teachers in grades seven through twelve.

Literary study for students planning to teach English should emphasize a range of close reading experiences in different kinds of literature (e.g., literature of the ancient world, Shakespeare, British literature of the nineteenth and twentieth centuries, American literature, literature for adolescents, literature of American ethnic groups, literature by women, folk literature) as well as a variety of methods for exploring a literary text.

Students planning courses that will help them in their first teaching experiences should remember that they will have to work with details of expression in English. They will need advanced training in approaches to teaching writing and in writing. Nonfiction, poetry, and fiction are all important since they help students understand and use linguistic, rhetorical, and stylistic devices in various kinds of writing.

An understanding of the nature of the English language—including syntax, phonology, and semantics—will help them understand language development and how language can be adapted to meet various speaking and writing situations.

Since communication also occurs visually, students should explore the relationships between written, oral, and visual media.

Finally, students should explore the processes of reading, from the first stages of learning to read through advanced stages, when a reader increasingly comes to understand and respond to details of meaning and nuances of expression.

All of these areas of study can be satisfied by courses within the department except the exploration of the processes of reading. That area can be satisfied by courses in the College of Education.

Prospective English teachers should remember that an undergraduate degree represents only minimal training, so they should plan a program that will permit graduate study at a later time.

English majors seeking teacher certification must be admitted to the teacher education program and must plan with their advisers to take appropriate education courses concurrently with courses in English. In addition, students must devote one semester of their senior year to professional training apart from any other course work.

The department also participates in a joint major in English and elementary education. Students interested in such a program should consult with their advisers in elementary education.

Students who seek certification for secondary teaching in fields other than English may seek minor certification in English. This is particularly appropriate for students majoring in speech, journalism, Spanish, French, or German. These students must complete 28-33 semester hours of English, excluding freshman courses in rhetoric, speech, or writing.

The English minor certification program must include a course in each of these areas: advanced composition, approaches to teaching high school writing, linguistics, American literature of the twentieth century, British literature of the nineteenth or twentieth centuries, literature for adolescents, and visual/oral communication. In addition, students are required to take 7S:115 Methods: English, and 7S:194 or 7S:195, which are courses in reading for secondary school students, offered by the College of Education's Division of Secondary Education.

While this program meets minimum requirements for certification, the department recommends that students who want to teach English have considerably more training in the field.

Graduate Programs

Master of Arts (Literary Studies)

The M.A. in literary studies is a program for students who want to acquire an understanding of what it means to study literature professionally. Those who seek an M.A. in literary studies may include students who would like some exposure to graduate study before deciding whether to continue toward a doctorate; teachers in secondary schools who want to gain extra credit and background; or independent readers and writers seeking intellectual growth unrelated to a specific career objective. All M.A. students are full participants in the community of the department and may enroll in any of its graduate courses or seminars.

The requirements for the degree are designed to give students a general knowledge of the periods, movements, and major works of English and American literary history, to develop students' sensitivity to artful language and expression, and to introduce some critical methods of literary study. Each of the requirements allows a wide choice of courses within the specified areas.

Elective courses, which constitute about one-third of the course work toward the degree, may be chosen from graduate courses both inside and outside the English department. The program's flexibility enables students, consulting closely with their advisers, to tailor their plan of study to the pattern of their interests. Depending on whether the student takes an examination or writes a thesis, the program requires either 30 or 33 semester hours of graduate-level credit, 24 of which must be earned in residence with a grade-point average no lower than 3.00.

Course Requirements

Literary history—five courses: one each from five of six historical periods; at least one course must be numbered 200 or above.

Language and writing—one course in the history, philosophy, psychology, or instruction of language or in the practice or teaching of expository writing.

Critical methods—one course in critical theory or methodology; any seminar in literary studies automatically satisfies this requirement.

Thesis or Comprehensive Examination

There are two ways to complete the program.

- The usual conclusion is an eight-hour written comprehensive examination based on a reading list drawn from the various periods of English and American literature. Students may obtain copies of the current reading list from the graduate secretary.
- Students with strong academic records, solid writing skills, and a desire to explore a defined topic at length may petition the Graduate Steering Committee for permission to write an M.A. thesis in literary studies. The thesis is a critical or scholarly work of about 10,000 words (approximately 40 pages), written under the supervision of a thesis director and requiring registration for 3 to 6 semester hours of credit above the 30 hours of required course work. Students who receive permission to proceed must assemble a thesis committee, receive the committee's approval of the thesis prospectus, and pass an oral defense of the completed thesis.

Master of Arts (Expository Writing)

This program is designed for persons wishing to become essayists, freelance writers, editors, or writing teachers.

To qualify for the M.A. with emphasis in expository writing, students must complete 30 semester hours of graduate work with a grade-point average no lower than 3.00. At least 24 semester hours must be earned in residence at The University of Iowa, including 9 semester hours of work in advanced composition with a grade of A or B. In addition to the 30 semester hours of course work, students are required to complete at least 3 and no more than 6 semester hours of credit for the thesis.

In consultation with an adviser, each student designs a program of courses suited to his or her professional interests. Thus, each student's plan of study is highly individualized and may include courses from widely different areas and departments of the University.

Finally, each student produces a thesis, which may be an extended essay, a collection of essays, or a project involving some other form of expository writing. An oral examination covers the project, and the finished thesis must receive final approval by the student's thesis committee.

Students interested in this program should consult the director of the M.A. with emphasis in expository writing.

Master of Fine Arts

The purpose of the M.F.A. program is to provide professional guidance and a stimulating environment for students with previous achievement or notable promise in writing poetry or fiction. The flexible requirements include 48 semester hours of graduate credit, earned chiefly in the Writers' Workshop; a collection of poems or short stories, or a novel; and satisfactory performance on an examination on modern poetry or fiction.

Doctor of Philosophy

The Ph.D. program is designed as preparation for the teaching, publishing, and service required of college and university faculty members. The doctorate requires 72 semester hours of graduate credit, at least 30 of which must be earned in residence at The University of Iowa.

Concentrations are possible in areas such as literary history, literary theory, genre criticism, rhetorical theory, stylistics, writing theory and pedagogy, folklore, bibliography, comparative literature, and linguistics.

Requirements for the Ph.D. include:

Formal admission to candidacy by a vote of the full faculty of the department, usually during the third semester of doctoral study;

Demonstration of competence in two foreign languages or mastery of a single foreign language and its literature;

Three seminars taken at The University of Iowa;

An oral examination covering written examinations in two areas, one of which must be a period from English and/or American literary history, and an "issues paper";

A dissertation, which is usually a scholarly work but may, in rare cases and with special permission, be a novel or a collection of poems or short fiction; and

A final examination in defense of the dissertation.

All doctoral candidates are encouraged to gain teaching experience, preferably in the College of Liberal Arts programs in rhetoric and in the literature General Education Requirement.

Application forms and a complete description of the program are available from the graduate secretary of the department.

Financial Aid

Aid is available to graduate students in the form of scholarships, fellowships, and teaching and research assistantships. It is awarded on a competitive basis. Since sources are limited, usually fewer than half of new doctoral students receive aid. Many, but not all, advanced doctoral students receive support.

Financial aid applications are considered only from students who have applied or been admitted to a degree program in the Graduate College. Applications and all necessary supporting material must be submitted by February 1 for the following academic year. Forms are available from the English department and the University's Office of Admissions.

Admission

Admission requirements are stated in *Special Requirements and Information/Graduate Admissions*, which is available from the English department graduate office, 329 English-Philosophy Building.

Writing Programs

For the past 50 years, The University of Iowa has been a national leader in virtually all areas of the teaching of writing. In 1922 it became the first institution of higher education to accept creative dissertations for advanced degree programs.

Founded in 1936, the Writers' Workshop was a pioneer in the field of creative writing; it numbers scores of distinguished poets and novelists among its alumni. The workshop provides opportunities for students at all levels to work with outstanding teacher-authors. It also brings numerous prominent authors to campus each year for lectures and readings.

The International Writing Program, founded in 1966, brings numbers of prominent foreign writers to campus each year.

The University of Iowa also is a leader in the area of expository writing and rhetorical theory; it is one of the few academic institutions in the nation that offer a full range of graduate course work in this area.

Facilities

The University library is strong in all areas of English and American literature. Partly because of the influence of the Writers' Workshop, the library has particular strengths in twentieth-century fiction and poetry, including manuscript collections of twentieth-century authors.

The Zimansky Reading Room (the departmental library) has a small but select collection of books and journals for use by faculty and students.

Several periodicals are published under the department's aegis: *The Iowa Review*, *The Mystics Quarterly*, *The Walt Whitman Quarterly Review*, and *Philological Quarterly*. These journals offer opportunities for especially qualified graduate students to work as research assistants or editorial associates. *The Iowa Journal of Literary Studies*, edited by English department graduate students, features creative and scholarly work by students in English and related areas.

The Windhover Press, which publishes fine editions of works by contemporary authors, also is housed in the department. It offers qualified students the opportunity to learn the art of fine printing.

The Department of English, the Writers' Workshop, and the International Writing Program sponsor a rich and extensive

series of readings and lectures by poets, fiction writers, and scholars, all open to students in the department.

The Association of Graduate Students in English sponsors social and intellectual events during the year and provides a forum for student opinion. All graduate students in the department are members.

Courses

Individual descriptions for the English courses listed here are not included because content and emphasis may vary considerably from one semester to the next. Detailed course descriptions for all undergraduate courses in a specific semester are published in the *Liberal Arts Guide to Courses*. Detailed course descriptions for a semester's graduate courses are available in the English department office well in advance that semester.

General Education Literature

The General Education Requirement in the humanities is satisfied by taking 8G:1 The Interpretation of Literature and two other approved humanities courses. 8G:1 (or its equivalent by examination or transfer) is a prerequisite for the other courses (8G:2 through 8G:15) and must be taken first. The pass/nonpass option is available only for students in the Colleges of Nursing and Engineering with the consent of the student's adviser and the instructor. Students must successfully complete the rhetoric requirement before they may take 8G courses.

8G:1 The Interpretation of Literature 3 s.h.
Poetry, short fiction, drama, and the novel, mainly English and American. GER: humanities.

8G:2 Biblical and Classical Literature 3 s.h.
Selections from Old and New Testament literature, Homer, Greek dramatists, Plato, Virgil, and others. GER: humanities. Prerequisite: 8G:1.

8G:3 Medieval and Renaissance Literature 3 s.h.
Selections from *Beowulf*, Dante, Chaucer, Shakespeare, Milton, and others. GER: humanities. Prerequisite: 8G:1.

8G:4 Epic and Tragic Literature 3 s.h.
Heroes and heroines as the products of imagination; literary representations of heroes and heroines in differing social and historical situations and how their representation shapes our understanding of heroism. GER: humanities. Not open to students who have taken 8G:12. Prerequisite: 8G:1.

8G:5 The Forms of Comic Vision 3 s.h.
The scope of comic imagination as it confronts social conventions and offers alternative points of view; comic works considered in their historical context. GER: humanities. Not open to students who have taken 8G:12. Prerequisite: 8G:1.

8G:6 Narrative Literature 3 s.h.
Selected masterpieces and recent developments in the art of storytelling in both poetry and prose. GER: humanities. Prerequisite: 8G:1.

8G:7 Lyric Poetry 3 s.h.
Poetry from major periods of development as well as contemporary verse; emphasis on distinctive language and major formal patterns of poetry. GER: humanities. Prerequisite: 8G:1.

8G:8 Literature of the Theater 3 s.h.
Selected plays from Shakespeare's time to present; some consideration of dramatic motive and form in other genres. GER: humanities. Prerequisite: 8G:1.

8G:9 American Lives 3 s.h.
Major works of American autobiography. GER: humanities. Prerequisite: 8G:1.

8G:11 The Personal Voice 3 s.h.
The nature of the author's "voice" in fiction, poetry, autobiographies, and prose essays from Augustine to the present. GER: humanities. Prerequisite: 8G:1.

8G:12 Comic and Tragic Literature 3 s.h.
Interrelations of comic and tragic literature and their connection with human experience; examination of comic and tragic forms and their uses in differing social and historical situations. GER: humanities. Not open to students who have taken 8G:4 or 8G:5. Prerequisite: 8G:1.

8G:14 Literatures of the African Peoples 3 s.h.
Selected work in English by authors of African descent from America, continental Africa, and the Caribbean. GER: foreign civilization and culture, humanities. Prerequisite: 8G:1. Same as 129:8, 141:14.

8G:15 Women and Literature 3 s.h.
Works from various genres and time periods focusing on a wide range of women's experiences. GER: humanities. Prerequisite: 8G:1.

Primarily for Undergraduates

English department courses are open to all undergraduates who have satisfied the rhetoric requirement. In most cases, undergraduates should complete one or more departmental courses below the 100-level before attempting 100-level courses. English majors are required to take at least one course from the first four categories.

Readings

These specialized discussion courses are intended for English majors; other students with considerable experience in the study of literature should consult the instructor before registering.

8:34 Reading Novels 3 s.h.

8:35 Reading Poems 3 s.h.

8:36 Reading Short Stories 3 s.h.

8:37 Reading Plays 3 s.h.

8:38 Reading Essays 3 s.h.

8:39 Reading Criticism 3 s.h.

Authors

8:71 Chaucer 3 s.h.

8:72 Shakespeare 3 s.h.
Same as 49:13.

8:73 Milton 3 s.h.

8:74 Selected American Authors 3 s.h.

8:76 Selected Modern Authors 3 s.h.

8:77 Selected Authors 2-3 s.h.

8:110 Selected Authors 3 s.h.

8:120 Chaucer 2-3 s.h.

8:122 Shakespeare 3 s.h.
Same as 49:182.

8:123 Milton 2-3 s.h.

8:128 Selected Modern Poets 3 s.h.

8:137 Selected American Authors 3 s.h.

8:165 Shakespeare Selected Plays 3 s.h.
Same as 49:198.

8:178 Old English Beowulf 3 s.h.

8:184 Selected Black Writers 3 s.h.
Same as 129:184.

8:192 Dante and Romance Poetry 3 s.h.
Same as 48:192.

Literature and Culture

8:101 Literature and Culture of the Middle Ages 3-6 s.h.

8:102 Literature and Culture of the Renaissance 3-6 s.h.

8:103 Literature and Culture of 18th-Century England 3-6 s.h.

8:104 Literature and Culture of 19th-Century England 3-6 s.h.

8:105 Literature and Culture of 19th-Century America 3-6 s.h.

8:106 Literature and Culture of 20th-Century America 3-6 s.h.

8:129 Anglo-Irish Literature and Culture 3-4 s.h.

8:131 Literature and Culture of 17th-Century England 3-4 s.h.

8:141 Literature and Culture of America Before 1800 4 s.h.
Same as 45:110.

8:164 Literature and Culture of the 20th Century 3-4 s.h.

Cultural Study

8:111 American Folk Literature 3 s.h.

8:112 American Ethnic Literature 3 s.h.

8:113 American Indian Literature 3 s.h.

8:114 American Regional Literatures 3 s.h.

8:116 Afro-American Literature I 3 s.h.
Same as 129:116.

8:117 Afro-American Literature II 3 s.h.
Same as 129:117.

8:118 Black Women Writers 3 s.h.
Same as 129:127.

8:130 Images of Black Women in Modern American Fiction 3 s.h.
Same as 129:120.

8:142 Popular Literatures 3 s.h.

8:151 Literature and Anthropology 3 s.h.
Same as 48:151, 113:109.

8:152 Studies in the Fiction of Afro-Americans 3 s.h.
Same as 129:167.

8:153 Studies in the Poetry of Afro-Americans 3 s.h.
Same as 129:177.

8:154 Afro-American Drama 3 s.h.
Same as 49:195, 129:180.

8:159 Regional Women Writers 3 s.h.
Same as 131:159.

8:161 Women in Literature 2-3 s.h.
Same as 131:161.

8:169 Changing Concepts of Women in Literature 3 s.h.
Same as 131:169.

8:173 Literature and the Film 3 s.h.
Same as 36B:155, 48:173.

8:174 Literature and Science 3 s.h.

8:175 Literature and Psychology 3 s.h.
Same as 48:167.

8:176 Literature and Philosophic Thought 2-3 s.h.
Same as 32:148.

8:177 Literature and Art 3 s.h.
Same as 48:177.

8:179 Literature and Society 3 s.h.

8:182 Science Fiction 3 s.h.

8:188 Prose by Women Writers 3 s.h.
Same as 131:188.

Period and Genre

8:1, 8:5, 8:8, 8:40, and 8:41 offer useful introductions to the study of literature. Many period and genre courses may be of interest to both English majors and nonmajors.

8:1 Modern Fiction 3 s.h.

8:5 The Short Story 3 s.h.

8:8 Classical and Biblical Literature 3 s.h.

8:40 Major Texts in World Literature I 3 s.h.
GER: humanities. Same as 48:40.

8:41 Major Texts of World Literature II 3 s.h.
GER: humanities. Same as 48:41.

8:47 Masterpieces of English Literature 3 s.h.

8:55 American Poetry 3 s.h.

8:56 American Literary Classics 3 s.h.

8:57 American Novel I 3 s.h.

8:58 American Novel II 3 s.h.

8:59 American Short Story 3 s.h.

8:60 Selected Works of the Middle Ages 3 s.h.

8:62 Selected Works of the 18th Century 3 s.h.

8:64 Selected American Works Before 1900 3 s.h.

8:65 Selected Early Modern Works 3 s.h.

8:66 Selected Works of the 20th Century 3 s.h.

8:67 Masterpieces of the Renaissance I 3 s.h.

8:68 Masterpieces of the Renaissance II 3 s.h.

8:69 Age of Wordsworth 3 s.h.

8:70 Selected Victorian Works 3 s.h.

8:75 In Print/In Person 3 s.h.
Not open to freshmen. Prerequisite: a college-level literature course.

8:109 European Literature of the 19th Century 3 s.h.
Same as 48:106.

8:119 African Literature 3 s.h.
Same as 129:119, 141:119.

8:124 American Poetry 2-3 s.h.

8:125 Modern British and American Poetry 3 s.h.

8:126 Literary Genres in European Literature II 3 s.h.
Same as 48:115.

8:127 Contemporary Scene in Poetry 3 s.h.
Same as 48:127.

8:132 The English Novel Defoe to Austen 3 s.h.

8:133 English Novel Scott to Butler 3 s.h.

8:134 American Novel to 1900 3 s.h.

8:135 American Novel 1900-1945 2-3 s.h.

8:136 American Short Story 2-3 s.h.

8:138 The European Novel 1700-1850 3 s.h.

8:139 The European Novel 1850 to Present 3 s.h.

8:140 Contemporary Scene in Fiction 3 s.h.
Same as 48:140.

8:144 Medieval Drama 3 s.h.
Same as 49:181.

8:145 English Renaissance Drama 3 s.h.
Same as 49:187.

8:146 Restoration Drama 3 s.h.
Same as 49:183.

8:148 Modern Drama Ibsen to Shaw 3 s.h.
Same as 49:185.

8:149 Modern Drama Brecht to Stoppard 3 s.h.
Same as 49:186.

8:150 American Drama to 1945 3 s.h.
Same as 49:188.

8:158 Survey of Non-fiction Prose 3 s.h.

8:160 Selected Themes in Literary Works 3 s.h.

8:162 Literature of Peace and War 3 s.h.

8:163 17th-Century Lyric Poetry 3 s.h.

8:166 Themes and Modes in Literature by Women 3 s.h.
Same as 131:166.

8:167 Studies in Drama 3 s.h.
Same as 49:189.

8:170 Literary Genres and Modes 3 s.h.

8:172 Narrative and Related Art Forms 3 s.h.
Same as 36B:158, 48:172.

8:183 Literary Genres in European Literature I 3 s.h.
Same as 48:113.

8:186 American Autobiography 3 s.h.
Same as 45:190.

8:190 Augustine to Boccaccio 3 s.h.
Same as 48:190.

8:191 International Literature Today 1,3 s.h.
Same as 48:191.

8:193 Celtic and Norse in Translation 3 s.h.

8:196 American Novel Since 1945 3 s.h.

8:197 American Drama Since 1945 3 s.h.
Same as 49:117.

Special

8:000 Cooperative Education Internship 0 s.h.

8:51 Traditional Lyric Structures 3 s.h.

8:52 Non-traditional Lyric Structures 3 s.h.

8:53 Lyric Structures 3 s.h.

8:99 Undergraduate Seminar 3 s.h.
Same as 48:95.

8:100 Introduction to Critical Problems 3 s.h.
Same as 48:100.

8:147 Literary Publishing 3 s.h.
Same as 108:147.

8:187 Hand-Printed Book Problems in Design arr.
Same as 108:187.

8:194 Introduction to Feminist Criticism 3 s.h.
Same as 131:194.

8:199 Special Project for Undergraduates arr.

Honors

Open only to students admitted to the English department honors program. Instructor's consent may be required.

8:98 Honors Proseminar 4 s.h.

8:198 Undergraduate Honors Project 4 s.h.

For Graduates

Introductory

8:203 History of the Book 3 s.h.
Same as 19:251, 21:223.

8:247 Literary Magazines 1-3 s.h.

Medieval Language and Literature

8:214 Fourteenth-Century Literature 3 s.h.

8:215 Middle English Language and Literature 4 s.h.

8:217 Fifteenth-Century Literature 3 s.h.
Same as 48:267.

Literary Periods

8:219 Issues in Sixteenth-Century Literature 3 s.h.

8:220 Issues in Seventeenth-Century Literature 3 s.h.

8:221 Restoration and Early Eighteenth-Century Literature: 1660-1740 3 s.h.

8:222 Later Eighteenth-Century Literature: 1740-1800 3 s.h.

8:223 Romantic Literature 3 s.h.

8:224 Early Victorian Literature 3 s.h.

8:225 Late Victorian and Edwardian Literature 3 s.h.

8:226 British Literature: 1914-1945 3 s.h.

8:229 Contemporary British Literature Since 1945 3 s.h.

8:231 Early American Literature 3 s.h.

8:232 American Romantic Literature 3 s.h.

8:233 American Realistic Literature 3 s.h.

8:234 Early Twentieth-Century American Literature 3 s.h.

8:235 American Poetry 3 s.h.

8:236 American Fiction 3 s.h.

8:244 Issues in Eighteenth-Century Literature 3 s.h.

8:246 Modernist Crosscurrents 3 s.h.

8:254 Renaissance Tragedy 3 s.h.

8:257 Renaissance Lyric 3 s.h.
Same as 48:257.

8:258 Renaissance Comedy 3 s.h.

8:260 Issues in Sixteenth- and Seventeenth-Century Literature 3 s.h.

8:270 Special Topics: English Literature Before 1800 3 s.h.

Authors

8:227 Three African Writers 3 s.h.
Same as 129:227, 141:227.

8:251 Chaucer 3 s.h.

8:252 Spenser 3 s.h.

8:253 Shakespeare 3 s.h.
Same as 49:213.

8:256 Selected Authors 3 s.h.

Literary Theory and Criticism

8:261 History of Criticism: Plato to 1700 3 s.h.
Same as 48:261, 49:417, 14:261.

8:262 History of Criticism: 1700-1950 3 s.h.
Same as 48:262, 49:418.

8:263 Issues in Contemporary Literary Criticism 3 s.h.
Same as 48:263.

8:265 Feminist Criticism 3 s.h.
Same as 131:265.

8:267 Classical Rhetoric 2-4 s.h.
Same as 36R:301.

8:268 Modern Rhetoric 2-4 s.h.
Same as 36R:302.

8:277 Introduction to Contemporary Literary Theory 3 s.h.
Same as 35:281, 48:217.

8:284 Types of Modern Criticism 3 s.h.
Same as 35:284, 48:284.

8:306 Studies in Language Theory 2-4 s.h.
Same as 36R:403.

Literary Themes, Genres, and Modes

8:228 Blacks in the Literature of Black and White Authors 3 s.h.
Same as 129:228.

8:259 Law and Lawyers in Literature arr.
Same as 91:659.

8:274 Poetic Modes 3 s.h.

8:276 Narrative Modes 3 s.h.

8:317 Studies in Satire 3 s.h.

8:318 Topics in Irish Literature 3 s.h.

8:340 Theories of American Literature 3 s.h.

8:382 Literary Genres and Modes 3 s.h.
Same as 48:382.

Special Period and Cultural Studies

8:313 Modern Studies 3 s.h.

8:314 Postmodern Studies 3 s.h.
Same as 48:314.

Comparative and European Literature

8:373 European Renaissance 3 s.h.
Same as 48:373.

8:380 Intellectual Backgrounds of Literary Periods 3 s.h.
Same as 48:380.

Seminars

Advanced work in literary history, criticism, and theory; concentration varies from semester to semester. Consent of instructor required.

8:402 Seminar: Medieval Literature arr.

8:404 Seminar: Sixteenth-Century Literature arr.

8:405 Seminar: Renaissance Nondramatic Literature arr.

8:407 Seminar: Renaissance Literature arr.

8:411 Seminar: Shakespeare arr.

8:414 Seminar: 17th-Century Literature arr.

8:421 Seminar: Restoration and Eighteenth-Century Literature arr.

8:431 Seminar: English Romanticism arr.

8:432 Seminar: Victorian Literature arr.

8:434 Seminar: Twentieth-Century British Literature arr.

8:435 Seminar: Twentieth-Century British and American Literature arr.

8:436 Seminar: British Poetry arr.

8:437 Seminar: Nineteenth-and Twentieth-Century British Literature arr.

8:446 Seminar: Nineteenth-Century American Literature arr.

8:452 Seminar: Short Fiction arr.

8:458 Seminar: American Writers of the Twentieth Century arr.

8:460 Seminar: Problems in Aesthetics and Literary Theory arr.
Same as 48:460.

8:465 Seminar: History, Literature, and Culture arr.
Same as 45:260.

8:472 Seminar: Literature and Communication arr.
Same as 48:472.

Independent Study

8:500 Advanced Studies in an Author arr.

8:505 Advanced Studies in a Literary Period arr.

8:510 Advanced Studies in a Literary Form arr.

8:515 Advanced Studies in a Literary Genre arr.

8:520 Advanced Studies in a Literary Mode arr.

8:525 Advanced Studies in a Literary Movement arr.

8:530 Advanced Studies in a Literary Theme arr.

8:535 Advanced Studies in Literary Criticism arr.

8:550 Advanced Studies in an Interdisciplinary Subject arr.

8:585 M.A. Thesis in Literary Studies arr.

8:590 Special Project for Graduate Students arr.

8:595 Ph.D. Thesis arr.

Linguistics and Language

8L:100 Introduction to Linguistics 3 s.h.
Same as 103:100.

8L:120 Historical and Comparative Linguistics 3 s.h.
Same as 103:120.

8L:131 History of the English Language 3 s.h.
Same as 103:131.

8L:132 Elementary Old English 4 s.h.
Same as 103:132.

8L:142 Modern English Grammar 3 s.h.
Same as 103:142.

8L:159 Language, Society, and Education 3 s.h.
Same as 103:105.

8L:198 Old Norse 3-4 s.h.
Same as 103:251.

Professional

For students interested in improving their reading skills.

8P:20 Advanced Reading Comprehension 1 s.h.

8P:30 Speeded Reading 1 s.h.

8P:40 Practical College Vocabulary 1 s.h.

Although the following courses are open to all graduate students, their primary purpose is to offer theoretical and practical training to those who plan to teach.

8P:182 Language and Learning 2-3 s.h.
Same as 7S:182, 7E:182.

8P:190 Methods English 3 s.h.
Same as 7S:115.

8P:198 Literature for Adolescents 3 s.h.
Same as 7S:193.

8P:200 Computer Applications in the Humanities 3 s.h.

8P:316 Seminar: Recent Developments in Literature for Adolescents arr.
Same as 7S:316, 21:216.

8P:370 Teaching in a Reading Laboratory 3 s.h.

8P:405 M.A. Seminar: English Education arr.
Same as 7S:315.

8P:425 Ph.D. Seminar: English Education arr.
Same as 7S:415.

8P:450 Colloquium: Teaching Freshman Rhetoric arr.
Same as 36:250.

Expository Writing

The following courses may be retaken for credit: 8W:10, 8W:109, 8W:131, 8W:150, 8W:209, and 8W:350. Others may be repeated for credit with consent of both the instructor and either the director of undergraduate studies or the director of graduate studies.

Practice in Writing

Intensive practice in elements of composition and kinds of exposition.

8W:10 Expository Writing 2-3 s.h.

8W:15 Technical and Scientific Writing 2-3 s.h.

8W:100 Grammar for Writers 3 s.h.

8W:101 Greek and Latin for Vocabulary Building 3 s.h.
Same as 20:101.

8W:102 Grammar and Style 3 s.h.

8W:104 Personal Writing 3 s.h.

8W:109 Advanced Writing 2-3 s.h.

8W:112 Writing for the Sciences 3 s.h.

8W:113 Writing for Business and Industry 3 s.h.

8W:115 Writing for the Arts 3 s.h.

8W:130 Extended Prose: New Journalistic Writing 3 s.h.

8W:131 Forms of Writing 3 s.h.

8W:150 Undergraduate Essay Workshop arr.

8W:209 Advanced Writing 3 s.h.

8W:218 Writing Workshop for Teachers 2 s.h.

8W:290 Critical Writing arr.

8W:350 Essay Writing Workshop arr.

Theory and Practice of Writing

Theory and analysis of expository writing combined with practical experimentation in writing; for people who intend to practice, criticize, and/or teach expository writing.

8W:137 Tradition of the Essay 3 s.h.

8W:138 Art of the Essay 3 s.h.

8W:141 Approaches to Teaching Writing 3 s.h.

8W:236 Theories of Style 3 s.h.

8W:239 Rhetorical Theory: Analysis and Application 3 s.h.

8W:240 Theories of Writing 2-3 s.h.

8W:243 Colloquium in the Teaching of Writing 2 s.h.

8W:245 Research on Writing 3 s.h.

8W:247 Varieties of the Essay 3 s.h.

8W:248 Art of the Essay 3 s.h.

8W:249 Form of the Essay 3 s.h.

8W:375 Teaching in a Writing Lab 3 s.h.

8W:472 Seminar: Theories of Writing arr.

Independent Study

8W:199 Undergraduate Project in Expository Writing arr.

8W:550 Special Project in Expository Writing arr.

8W:560 Special Project in Teaching of Writing arr.

8W:580 M.A. Thesis in Expository Writing arr.

Creative Writing

All may be repeated for credit.

General Interest

Practice in elements and forms of creative writing.

8W:23 Creative Writing 3 s.h.

8W:116 History and Theory of Translation 3 s.h.
Same as 48:116.

8W:151 Fiction Writing 3 s.h.

8W:152 Poetry Writing 3 s.h.

8W:161 Advanced Fiction Writing 3 s.h.

8W:162 Advanced Fiction Writing II 3 s.h.

Workshops and Seminars

Open only to Writers' Workshop students or to others with consent of instructor.

8W:163 Undergraduate Writers' Workshop: Fiction arr.

8W:166 Undergraduate Writers' Workshop: Poetry arr.

8W:251 Fiction Workshop arr.

8W:252 Poetry Workshop arr.

8W:260 Translation Workshop arr.
Same as 48:260.

8W:270 Form of Fiction 3 s.h.

8W:275 Form of Poetry 3 s.h.

8W:490 Seminar: Problems in Modern Fiction arr.

8W:495 Seminar: Problems in Modern Poetry arr.

Independent Study

8W:195 Undergraduate Project in Creative Writing arr.

8W:555 Graduate Project in Creative Writing arr.

8W:590 M.F.A. Thesis arr.

EXERCISE SCIENCE

See "Division of Physical Education."

FRENCH AND ITALIAN

Chair: John T. Nothnagle
Professors: Charles F. Altman, Jacques A. Bourgeacq, Simone Delaty, John T. Nothnagle, Richard O'Gorman, Steven Ungar
Associate professors: Janet G. Altman, Wendelin Guentner, L. Kathy Heilenman, Geoffrey Hope
Assistant professors: Cinzia Blum, Deborah Contrada, Michel Laronde, Rosemarie Scullion
Undergraduate degrees offered: B.A. in French, Italian
Graduate degrees offered: M.A., Ph.D. in French

Undergraduate Programs

The department introduces students to the cultures of France and Italy, provides an understanding of those countries' historical and contemporary importance, and facilitates development of proficiency in the French and Italian languages. It also fosters critical appreciation of French and Italian literature and civilization.

Students may choose from a variety of programs of majors in French and Italian and electives for nonmajors with prerequisite linguistic skills. They are afforded flexible means to meet the foreign language General Education Requirement of the College of Liberal Arts and to satisfy individual needs and interests.

Students majoring in French or Italian may combine their studies with courses in education (see the "College of Education" section of the *Catalog*) to prepare for jobs in high school teaching. They may go on to graduate study in areas such as French, comparative literature, or history as preparation for college-level teaching. Or, in combination with other skills and studies, a major in French or Italian may prepare students for challenging career opportunities in the international areas of government, business, finance, travel, or communications, where the knowledge of a foreign language is essential.

Bachelor of Arts in French

The undergraduate major in French may be completed with an emphasis on literature, civilization, teaching, or applied French.

Courses taught in English do not count as credit toward the French major; nor does a grade of D in any required French course.

Literature Track

The literature track is designed for students who are interested in French literature or in combining the study of French literature with a major in another area, such as English, comparative literature, cinema, or fine arts. It requires a total of 35 semester hours of credit in French, including:

9:105-106 Second-Year Composition and Conversation 8 s.h.
9:111-112 Third-Year Composition 6 s.h.
9:126 French Conversation: Third Level 2 s.h.
9:136 French Conversation: Fourth Level 2 s.h.
9:175 Advanced French Pronunciation 2 s.h.
or
9:25 French Pronunciation 2 s.h.

A minimum of four 100-level courses in literature (at least two of which must be above the 150 level) plus a fifth 100-level course in a choice of literature, advanced language, or civilization, totaling 15 semester hours.

Civilization Track

The civilization track is designed for students interested in French history, politics, and culture and recommended for students who want to combine studies in French with a major in another area, such as history, political science, prelaw, or journalism and mass communication. It requires 35 semester hours of credit in French, including:

9:105-106 Second-Year Composition and Conversation 8 s.h.
9:111-112 Third-Year Composition 6 s.h.

A minimum of four 100-level courses in civilization and three 100-level courses in literature, totaling 21 semester hours and including at least one course in literature above the 150 level.

Teaching Track

The teaching track requires 35 semester hours of credit in French, including:

9:105-106 Second-Year Composition and Conversation 8 s.h.
9:111-112 Third-Year Composition 6 s.h.
9:175 Advanced French Pronunciation 2 s.h.
9:126 French Conversation: Third Level 2 s.h.
9:136 French Conversation: Fourth Level 2 s.h.

A minimum of five 100-level courses—at least two in literature and two in civilization—totaling 15 semester hours and including at least two courses above the 150 level.

The student who plans to acquire a secondary teaching certificate also must complete the requirements for teacher certification. See the "College of Education" section of the *Catalog*.

Applied French Track

The applied French track is designed for students with an interest in areas such as international business, commerce, law, and others in which applied French would be an asset. It requires 39 semester hours in French, including:

9:105-106 Second-Year Composition and Conversation 8 s.h.
9:111-112 Third-Year Composition 6 s.h.
9:115 Business French 3 s.h.
9:126 French Conversation: Third Level 2 s.h.
9:136 French Conversation: Fourth Level 2 s.h.

9:155 Commercial and Technical Translation	3 s.h.
9:197 Translation Project	3 s.h.
Two courses each in French civilization and literature	12 s.h.

Electives recommended as adjunct are courses in French stylistics and textual analysis, another language, economics, political science, and/or business administration.

Minor in French

The requirements for a minor in French are 15 semester hours with a minimum grade-point average of 2.00. Twelve of these must be taken at The University of Iowa in courses numbered 9:107 or above. Courses numbered in the 140s, 150-152, and 158 do not count toward the minor in French.

Bachelor of Arts in Italian

Requirements for the major in Italian include:

18:11-12 Intermediate Italian	6 s.h.
18:111-112 Advanced Composition and Conversation	7 s.h.
18:105-106 Introduction to Italian Literature	6 s.h.
18:119-120 Medieval and Renaissance Italian Literature	6 s.h.
A 100-level course taught in Italian	3 s.h.
Total	28 s.h.

Minor in Italian

The requirements for a minor in Italian are 15 semester hours with a minimum grade-point average of 2.00. Twelve of these must be taken at The University of Iowa in courses numbered 18:105 or above.

Honors

The department participates in the College of Liberal Arts Honors Program. To gain admission to the honors program in French or Italian, a student must have a 3.20 overall grade-point average; a 3.50 departmental grade-point average; and be enrolled in the College of Liberal Arts Honors Program. For additional information about requirements for honors in French or Italian, consult the French and Italian honors adviser.

Summer Program in France

The department is cosponsor of a summer program in France for students enrolled in the three Iowa Regents universities. Eligibility for the program requires a good basic knowledge of French (two years of college-level preparation is recommended), but students need not be French majors.

Centered in Lyon, the program combines formal class work in language skills with an integrated course in the culture and civilization of France, including visits to points of cultural and historical interest. Students may earn 8 or 9 semester hours of credit in the program.

Summer Program in Quebec

The department participates in the Committee on Institutional Cooperation (CIC) Summer French Program in Quebec at the Université Laval. The CIC is a nonprofit organization whose purpose is to foster cooperative educational opportunities among the Big Ten universities and the University of Chicago. Affiliated with the *Cours d'été pour non-francophones* of the Université Laval, the program is designed to offer qualified students the opportunity to increase their command of French in a French-speaking environment and to introduce them to the heritage and cultural traditions of a unique and vital segment of North American culture.

Foreign Language House

The French and Italian department maintains close connections with the *Maison Française* in the Foreign Language House at Hillcrest Residence Hall. Residents initiate cultural and educational programs with the participation of the faculty and other students, providing a unique opportunity to combine living with language learning.

Graduate Programs

Master of Arts in French without Thesis

Candidates must earn a minimum of 30 semester hours of graduate credit and pass a written and oral examination. The program must include 9:175 Advanced French Pronunciation, 9:209 Advanced Grammar and Lexicology, 9:210 Comparative Stylistics, and at least four graduate-level (200 and above) literature courses. With the permission of the departmental chair, candidates may take up to 6 of the required 30 semester hours outside the department.

Master of Arts in French with Thesis

The requirements for the thesis program are the same as for the M.A. without thesis, except that candidates may earn up to 6 semester hours of credit for thesis work. Candidates must defend the thesis at the time of the comprehensive examination.

Master of Arts in French Education

This program is intended primarily for prospective secondary school and junior college teachers. Requirements include a total of 38 semester hours of graduate credit, of which 8 may be in education or related fields, and at least 9 in graduate (200-level) courses in French literature.

The following courses also are suggested.

9:154 Textual Analysis	3 s.h.
9:209 Advanced Grammar and Lexicology	3 s.h.
9:210 Comparative Stylistics	3 s.h.
9:113-114 French Civilization	6 s.h.
9:150 Methods: Foreign Language	3 s.h.
9:162 Contemporary France	3 s.h.
9:175 Advanced French Pronunciation	2 s.h.

Candidates must pass a final written and oral examination.

Doctor of Philosophy

To fulfill requirements for the Ph.D. degree in French, candidates must complete at least three years of graduate study, of which at least one must be spent in residence at The University of Iowa. They must pass a comprehensive examination and make a successful oral defense of their dissertation.

Specific requirements include 9:251 Introduction to Old French Grammar and four semesters of college study or equivalent proficiency in a foreign language other than French.

Candidates also must complete three graduate courses, for a minimum total of 8 semester hours of credit in a related field, such as another literature, history, or philosophy, and must earn at least 6 semester hours of credit in 9:277 Thesis.

Students working toward the doctorate are required to spend at least one year teaching as graduate assistants in the department.

Admission

To be considered for admission to an M.A. program in French, applicants must have completed the equivalent of The University of Iowa undergraduate major in French. Students may make up deficiencies in previous training by taking appropriate courses.

The M.A. in French is prerequisite to admission to the Ph.D. program in French. Successful completion of the M.A. program, however, does not necessarily qualify a student for doctoral studies.

For students earning the M.A. at The University of Iowa, the M.A. comprehensive examination committee makes a recommendation concerning admission to the Ph.D. program. Students applying for doctoral candidacy with the M.A. earned at another institution are placed on conditional status when admitted. This status is reviewed after one semester of residence.

The Graduate Record Examination (GRE) General Test scores are required by the Graduate College.

Appointments

Teaching and research assistantships and University fellowships and scholarships are available to qualified graduate students (see the "Graduate College" section of the

Catalog). Inquiries should be addressed to the departmental office.

Exchange assistantship agreements with the University of Haute Bretagne, the University of Picardie, and the University of Poitiers provide one year of residence in France for a limited number of graduate students.

French Courses

A detailed description of courses offered each semester is available in the department office. All courses are given in French unless otherwise indicated. Courses numbered 150-199 are intended primarily for advanced undergraduates; a graduate student should consult with his or her adviser before registering for these courses.

Courses numbered 140-149 are given in English and do not count toward the requirements for the major or minor in French, but may be taken as electives; consultation with the adviser is recommended prior to registration. Students who have had significant experience with French through study or foreign residence are required to take placement tests prior to the opening of each term.

A student may not repeat for credit a course that is prerequisite to, or whose equivalent is prerequisite to, a higher-level course that the student has already completed.

Primarily for Undergraduates

9:000 Cooperative Education Internship **0 s.h.**

9:1 Elementary French **4 s.h.**
For students who have no knowledge of French. GER: foreign language.

9:2 Elementary French **4 s.h.**
GER: foreign language. Prerequisite: 9:1 or equivalent.

9:7 French for Travelers 1 **2 s.h.**
Basic conversational French for the traveler. Offered through the Saturday and Evening Class Program.

9:11 Intermediate French **3 s.h.**
For students who do not plan to continue the study of French after the second year. GER: foreign language. Open only to nonmajors. Prerequisite: 9:2 or equivalent.

9:12 Intermediate French **3 s.h.**
Continuation of 9:11. GER: foreign language. Open only to nonmajors. Prerequisite: 9:11 or equivalent.

9:25 French Pronunciation **2 s.h.**
May be taken concurrently with 9:105, 9:106, 9:111, 9:112.

9:26 French Conversation: First Level **2 s.h.**
May be taken independently or concurrently with 9:11, 9:12, 9:105, 9:106. GER: foreign language. Prerequisite: 9:2 or equivalent.

9:36 French Conversation: Second Level **2 s.h.**
Prerequisite: 9:26 or equivalent.

9:57 Special Work **arr.**
Prerequisite: 9:2 or equivalent.

9:100 Elementary French Intensive Course **5 s.h.**
First-year French in one semester. GER: foreign language.

9:105 Second-Year Composition and Conversation **2,4 s.h.**
Recommended for students who intend to continue study of French or who want to improve their active command of the language. GER: foreign language. Prerequisite: 9:2 or equivalent.

9:106 Second-Year Composition and Conversation **4 s.h.**
Continuation of 9:105. GER: foreign language. Prerequisite: 9:105 or equivalent.

For Undergraduates and Graduates

9:101 French for Reading/Research **1-3 s.h.**
For doctoral candidates in other departments who want reading ability for purposes of research.

9:102 French for Reading/Research **1-3 s.h.**

9:103 French for Reading/Research **1,3 s.h.**

9:104 French for Reading/Research **1,3 s.h.**

9:107 Introduction to French Literature: Medieval and Renaissance **3 s.h.**
Prerequisite: 9:12 or 9:106 or equivalent.

9:108 Introduction to French Literature: Seventeenth and Eighteenth Centuries **3 s.h.**
Prerequisite: 9:12 or 9:106 or equivalent.

9:109 Introduction to French Literature: Nineteenth Century **3 s.h.**
Prerequisite: 9:12 or 9:106 or equivalent.

9:110 Introduction to French Literature: Twentieth Century **3 s.h.**
Prerequisite: 9:12 or 9:106 or equivalent.

9:111 Third-Year Composition **3 s.h.**
Prerequisite: 9:106 or equivalent.

9:112 Third-Year Composition **3 s.h.**
Continuation of 9:111. Prerequisite: 9:111 or equivalent.

9:113 French Civilization **3 s.h.**
Survey of French social history from the Middle Ages to 1789. Prerequisite: 9:12 or 9:106 or equivalent.

9:114 French Civilization **3 s.h.**
Survey of French social history from 1789 to the present. Prerequisite: 9:12 or 9:106 or equivalent.

9:115 Business French **3 s.h.**
Survey of the language of economics and business, with practice in business correspondence and communication, analysis and practice in business documentation, active use of business vocabulary. Prerequisite: 9:112 or equivalent.

9:116 Business French Seminar **1 s.h.**
Concentration on banking techniques and practices in France and on the international scene; topics such as international trade, transportation, and the various types of firms in the French context; case studies and use of audiovisual materials; instruction in French, but questions in English permitted; for students in applied French, economics, law, and business administration.

9:119 Regents Summer Program in France **8-9 s.h.**

9:120 Internship in France **0-3 s.h.**
Two months' summer work in a French firm. Priority given to applied French students, selection by competition. Prerequisites: 9:115 and either 9:155 or 9:197, or consent of director.

9:126 French Conversation: Third Level **2 s.h.**
Prerequisite: 9:36 or equivalent.

9:136 French Conversation: Fourth Level **2 s.h.**
Prerequisite: 9:126 or equivalent.

9:141 Literature and Society **3 s.h.**

9:142 French and Francophone Literature and Cultures **3 s.h.**
Introduction through literature to nations and people whose indigenous cultures have been influenced by French language and civilization; discussion in English, readings in French. GER: foreign civilization and culture. Prerequisite: 9:12 or 9:106 or equivalent.

9:147 French Cinema and Culture **3 s.h.**
GER: foreign civilization and culture. Same as 36B:147.

9:150 Methods: Foreign Language **3 s.h.**
Ordinarily elected as 7S:116. Same as 35:115, 20:119, 13:120, 7S:116.

9:152 Issues and Materials in Foreign Language Education **3 s.h.**

9:154 Textual Analysis **3 s.h.**
Study of French literary styles through analysis of representative texts. Prerequisite: 9:112 or equivalent.

9:155 Commercial and Technical Translation **3 s.h.**
Methodology of translation with practical exercises in translating commercial and scientific texts. Prerequisite: 9:112 or consent of instructor. Recommended: concurrent registration with 9:115.

9:156 Pastiche and Parody **3 s.h.**
History and theory of the genre, its presence in original literature; analysis of texts; creative compositions in the genre. Prerequisite: 9:112 or equivalent.

9:158 Topics in Foreign Language Instructional Technology **2 s.h.**
Concepts for the development of technology-based materials for foreign language instruction; topics may include computer authoring languages, interactive media, and language laboratory methods and management. Same as 13:123, 35:117.

9:161 Topics in French Civilization **3 s.h.**
Prerequisite: 9:112 or equivalent.

9:162 Contemporary France **3 s.h.**
Careful study of major aspects of the Fifth Republic. Prerequisite: 9:113 or equivalent.

9:163 Francophone Literature of the African Diaspora **3 s.h.**
Survey of African and Caribbean literature written in French, with focus on Négritude movement. Prerequisite: 9:112 or equivalent. Same as 129:135, 141:163.

9:164 Québecois Literature **3 s.h.**
Prerequisite: 9:112 or equivalent.

9:165 French Civilization through the Arts **3 s.h.**
Prerequisite: 9:112 or equivalent.

9:175 Advanced French Pronunciation **2 s.h.**
Required for teachers. Prerequisite: 9:112 or equivalent.

9:177 The French Writer and Social Criticism **3 s.h.**
Prerequisite: 9:112 or equivalent.

9:178 Topics in French Literature **3 s.h.**
Topics in French and/or Francophone literature. Prerequisite: 9:112 or equivalent.

9:180 French Women Writers **3 s.h.**
Prerequisite: 9:112 or equivalent.

9:181 Women in Literature **3 s.h.**
Prerequisite: 9:112 or equivalent.

9:182 Critical Approaches to French Literature **3 s.h.**
Prerequisite: 9:112 or equivalent.

9:186 Twentieth-Century French Poetry **3 s.h.**
Prerequisite: 9:112 or equivalent.

9:187 Aspects of Poetry **3 s.h.**
Prerequisite: 9:112 or equivalent.

9:188 Twentieth-Century French Drama **3 s.h.**
Prerequisite: 9:112 or equivalent.

9:189 The Novel **3 s.h.**
Prerequisite: 9:112 or equivalent.

9:190 Essayists and Moralists **3 s.h.**
Prerequisite: 9:112 or equivalent.

9:191 Heroes and Humanists: Middle Ages and Renaissance **3 s.h.**
Prerequisite: 9:112 or equivalent.

9:192 French Classical Literature **3 s.h.**
Prerequisite: 9:112 or equivalent.

9:193 French Literature of the Enlightenment **3 s.h.**
Prerequisite: 9:112 or equivalent.

9:194 Nineteenth-Century French Novel **3 s.h.**
Prerequisite: 9:112 or equivalent.

9:195 Twentieth-Century French Novel **3 s.h.**
Prerequisite: 9:112 or equivalent.

9:196 Special Work **arr.**

9:197 Translation Project **3 s.h.**
Prerequisites: 9:155, and 9:112 or 9:115, or consent of instructor.

9:198 Honors Research and Thesis 3 s.h.
Faculty-guided research leading to writing an honors thesis in the French language.

Primarily for Graduates

9:209 Advanced Grammar and Lexicology 3 s.h.
Emphasis on syntax and vocabulary building as means of expression. Prerequisite: 9:112 or equivalent.

9:210 Comparative Stylistics 3 s.h.
Exercises in translation from English to French; translation of literary texts. Prerequisite: 9:209. Same as 48:211.

9:211 Romanticism 3 s.h.

9:212 Realism and Naturalism 3 s.h.

9:213 Eighteenth-Century Fiction 3 s.h.

9:214 Studies in the Enlightenment 3 s.h.

9:215 The Renaissance in France 3 s.h.

9:218 Symbolism 3 s.h.

9:221 Literature of the Twentieth Century 3 s.h.

9:223 Studies in Modern French Drama 3 s.h.

9:224 Modern French Novel 3 s.h.

9:227 Studies in the Seventeenth Century 3 s.h.

9:228 Classical Drama 3 s.h.

9:234 Seminar in Teaching: Grammar 1 s.h.

9:240 Studies in African Francophone Literature 3 s.h.
A variety of topics and approaches including genres, topics, geographical areas, or in-depth study of one author. Same as 129:235, 141:240.

9:250 Comparative Romance Linguistics 3 s.h.
Same as 20:201, 35:207, 103:262.

9:251 Introduction to Old French Grammar 3 s.h.

9:252 French Literature to 1180 3 s.h.
Epic and romance.

9:253 French Literature in the Reigns of Philippe Auguste and Saint Louis 3 s.h.

9:254 Literature of the Middle French Period 3 s.h.
Rutebeuf to Villon.

9:256 Language and Literature of Medieval Occitania: Provençal 3 s.h.

9:260 Critical Theory and Practice 3 s.h.

9:265 Narrative Modes 3 s.h.
Same as 36B:276, 48:276.

9:277 Thesis arr.

9:279 Special Work arr.

9:355 Seminar 3 s.h.

9:358 Seminar 3 s.h.

Italian Courses

A detailed description of courses offered each semester is available in the department office. All courses are given in Italian unless otherwise indicated. Students may not repeat for credit a course that is a prerequisite to, or whose equivalent is a prerequisite to, a higher-level course that they have already completed.

Primarily for Undergraduates

18:1 Elementary Italian 4 s.h.
For students who have no knowledge of Italian. GER: foreign language.

18:2 Elementary Italian 4 s.h.
GER: foreign language. Prerequisite: 18:1 or equivalent.

18:11 Intermediate Italian 3 s.h.
GER: foreign language. Prerequisite: 18:2 or equivalent.

18:12 Intermediate Italian 3 s.h.
GER: foreign language. Prerequisite: 18:11 or equivalent.

18:13 Conversational Italian 2 s.h.
Prerequisite: 18:2 or 18:103.

18:14 Conversational Italian II 2 s.h.
Prerequisite: 18:13 or equivalent.

18:53 Special Work arr.

For Undergraduates and Graduates

18:103 Intensive Elementary Italian 6 s.h.
GER: foreign language. Prerequisite: two years of another foreign language.

18:105 Introduction to Modern Italian Literature 3 s.h.
Prerequisite: 18:12.

18:106 Introduction to Modern Italian Literature 3 s.h.
Continuation of 18:105, but may be taken as an independent unit. Prerequisite: 18:12 or equivalent.

18:111 Advanced Composition and Conversation 4 s.h.
Prerequisite: 18:12 or equivalent.

18:112 Advanced Composition and Conversation 3 s.h.
Prerequisite: 18:111.

18:114 Studies in Italian Language 3 s.h.
Selected topics in the history of the Italian language. May be repeated. Prerequisite: 18:12 or equivalent.

18:119 Medieval and Renaissance Italian Literature 3 s.h.

18:120 Medieval and Renaissance Italian Literature 3 s.h.

18:153 Special Work arr.

18:162 Topics in Italian Civilization 3 s.h.

18:198 Honors Research and Thesis 3 s.h.
Faculty-guided research leading to writing an honors thesis in the Italian language.

Primarily for Graduates

18:208 Writers of Modern Italy 3 s.h.

18:217 Studies in Italian Literature 3 s.h.

18:219 Medieval and Renaissance Italian Literature 3 s.h.
Possible topics include Dante's *Divina Commedia*, Renaissance drama, romances of chivalry, Petrarch and the early Italian lyric.

18:279 Special Work arr.

GENERAL STUDIES

Coordinator: Patricia Addis
Faculty advisory committee: David Reynolds (Geography), John Stratton (Sociology), Katherine Tachau (History)
Undergraduate degree offered: B.G.S.

Degree Program

The Bachelor of General Studies (B.G.S.) degree is designed to give students flexibility in planning their academic programs. Since this is an interdepartmental program with no departmental major requirements, students are responsible for planning their own areas of concentration with the assistance of a B.G.S. adviser. B.G.S. students may not earn minors.

B.G.S. candidates develop creative emphases that draw upon the offerings of several departments and integrate varied approaches to a particular topic. A few examples of interdisciplinary programs are world order studies, environmental studies, technical writing, family studies, urban studies, and medieval culture. Programs that are covered by existing departmental majors are not appropriate for the B.G.S. degree. In all cases, careful and timely planning is essential.

Eligibility

Students who first enrolled prior to fall 1990 and who will graduate no later than August 1994 are eligible to enter the B.G.S. degree program.

Students who are not eligible may wish to consider seeking a B.A. degree in interdepartmental studies (see "Interdepartmental Studies" in this section of the *Catalog*).

Plan of Study

B.G.S. students are required to submit for approval a plan of study. The earlier a plan of study is submitted, the more effective the student's B.G.S. program will be. Because the B.G.S. degree program by definition allows for individualized academic programs, students are encouraged to apply for the B.G.S. program prior to or during the junior year.

Procedures Through Summer 1991

Sophomores or juniors who declare the B.G.S. must submit a plan of study within three weeks after the declaration. The adviser will not sign subsequent registration cards until an approved plan of study is in the student's folder.

Senior students (those who have earned 90 semester hours or more) who wish to declare the B.G.S. must submit the plan of study for approval prior to the declaration. Students who have completed more than 94 semester hours ordinarily may not declare the B.G.S. unless they can demonstrate that the advanced course work would fit a coherent plan of study. **Note:** Declaring the B.G.S. late may result in the need to complete more than the minimum of 124 semester hours required for the degree.

Procedures Effective Fall 1991

The plan of study must be approved prior to entry into the B.G.S. program. Students must complete a minimum of 30 semester hours after entry into the program. The final 30 semester hours include at least 15 in advanced-level course work. Hours taken during the semester in which the plan of study is approved are not counted as part of the final 30 semester hours.

Guidelines

Each plan of study submitted for approval must provide the following information:

A description of academic goals for the bachelor's degree, with a clear statement of the reasons for preferring the B.G.S. program to any departmental program;

A list of advanced-level course work already completed and a description of its relevance to the proposed plan of study; and

An outline of advanced-level course work planned for all remaining semesters, noting how the courses are related to each other, to personal interests, and to the central focus of the plan of study.

Each plan of study is approved by a committee that may include the coordinator, the faculty advisory committee, and the B.G.S. advisers. Reviews are held several times each semester.

If the committee does not grant approval, the plan of study may be returned to the student for revisions and resubmission at the next committee meeting. In some cases, the student may be referred to a more appropriate departmental major.

Students are required to follow the courses approved in the plan of study with each semester's registration. A limited number of substitutions may be allowed, but only if they are clearly consistent with the areas of concentration in the approved plan of study and only if they are approved in advance by the B.G.S. adviser. Unauthorized substitutions may be designated as elective course work.

Significant changes in the focus of a student's plan of study require the resubmission and approval of a revised plan of study. The student's academic adviser determines whether the changes warrant a revised plan.

Forms and guidelines for preparing the plan of study are available in the Bachelor of General Studies/Interdepartmental Studies Advisory Office, 113 Schaeffer Hall, or in the Office of Academic Programs, 116 Schaeffer Hall. A list of meeting times of the review committee is available each semester.

B.G.S. Requirements

In addition to having an approved plan of study, students must complete the following requirements for the B.G.S. degree.

General Education Requirements

Students must complete the College of Liberal Arts General Education Requirements, including two semesters of college-level foreign language or the equivalent. (See the College of Liberal Arts introductory section for specific information.)

Advanced Course Work

Students must complete at least 36 semester hours of advanced course work at The University of Iowa. No more than 18 semester hours of advanced course work from any one department may be counted toward fulfilling this requirement.

If more than 18 semester hours of advanced courses in one department, the total may be counted toward the 124 semester hours needed for graduation, but only 18 semester hours from that department may count toward the 36 hours of advanced courses.

Advanced courses typically are those numbered 100 and above. At the initiation of sponsoring departments and with approval of the Office of Academic Programs, courses numbered below 100 but taught at an advanced level also may be used to satisfy this requirement. Approved courses are listed later in this section.

The pass/nonpass grading option is not available for the 36 semester hours of advanced course work required for the degree, but may be used for advanced course work beyond the 36 semester hours.

Courses taken to satisfy the General Education Requirements may not be counted toward completion of the advanced course work requirement.

Some study abroad advanced course work is considered residential work for the purposes of B.G.S. requirements and college residence requirements. Students should check in advance with their B.G.S. adviser or with the B.G.S. coordinator.

University of Iowa Guided Correspondence Study advanced courses count toward the advanced course work requirement, but the College of Liberal Arts residence requirement must be met by other UI course work.

Grade-Point Average

Students must achieve a grade-point average of at least 2.00 in all college work attempted, all college work undertaken at The University of Iowa, and all advanced courses attempted.

Total Hours Earned

Students must earn a minimum of 124 semester hours of credit.

Restrictions

No more than 40 semester hours of credit in one academic department may count toward the 124 semester hours required for graduation. This includes both upper- and lower-level course work, and both UI and transfer course work.

Students completing a B.G.S. degree may earn no more than 30 semester hours of credit toward the 124 required for graduation from courses taken in all other colleges of the University (e.g., business administration, engineering). Undergraduate courses offered by the College of Education are an exception to this rule.

All other College of Liberal Arts policies regarding residence, pass/nonpass, satisfactory/fail, and academic standards apply to B.G.S. students.

Advanced Courses Numbered below 100

The following courses are accepted as part of the 36 semester hours of advanced course work required under the B.G.S. rules. Students must earn a grade-point average of 2.00 or higher in these courses and in those numbered 100 and above.

Advanced courses numbered below 100 that were taken before spring semester 1988 are not considered advanced-level course work. Some of the courses have prerequisites or require special permission signatures.

American Studies

45:90 Seminar in American Cultural Studies	3 s.h.

Art and Art History

1K:49 Advanced Painting	2-3 s.h.
1M:52 Undergraduate Printmaking II	3 s.h.
1N:17 Undergraduate Sculpture Workshop	3 s.h.

Asian Languages and Literature

39:23 Second-Year Sanskrit	3 s.h.
39:24 Second-Year Sanskrit	3 s.h.
39:50 Non-Western Literary Traditions	3 s.h.

Botany

2:3 Iowa Flora (accepted as advanced course work only if 2:101 Plant Taxonomy also is completed)	2 s.h.

Communication Studies

All courses numbered 36B:60 and above
All courses numbered 36C:60 and above

Comparative Literature

48:40 Major Texts in World Literature I	3 s.h.
48:41 Major Texts of World Literature II	3 s.h.
48:50 Non-Western Literary Traditions	3 s.h.
48:95 Undergraduate Seminar	3 s.h.

Computer Science

22C:21 Algorithms and Data Structures	3 s.h.
22C:23 Programming Language Concepts	3 s.h.
22C:31 Digital Systems and Computers	3 s.h.
22C:32 Introduction to Systems Software	3 s.h.
22C:51 Computer Graphics	3 s.h.
22C:55 Elementary Numerical Analysis	3 s.h.

Dance

137:91 Independent Study	arr.
137:92 Independent Choreography	arr.

Dental Hygiene

60:2 Human Histology	4 s.h.

English

All courses numbered above 8:10 except 8G courses

Geology

12:41 Mineralogy	4 s.h.
12:52 Elementary Petrology	4 s.h.
12:92 Structural Geology	5 s.h.

Mathematics

22M:27 Introduction to Linear Algebra	4 s.h.
22M:28 Calculus III	4 s.h.
22M:41 Differential Equations for Engineers	3 s.h.
22M:42 Vector Calculus for Engineers	3 s.h.
22M:50 Elements of Group Theory	3 s.h.
22M:55 Fundamental Properties of Spaces and Functions	3 s.h.
22M:70 Foundations of Geometry	3 s.h.
22M:72 Elementary Numerical Analysis	3 s.h.

Music

25:144 History of Music I	3 s.h.
25:146 History of Music II	3 s.h.

Physical Education and Sports Studies

28:83 Psycho-Social Dimensions of Physical Activity	3 s.h.

Spanish and Portuguese

35:30 Spanish Conversation Junior Level	2 s.h.
35:35 Spanish Conversation Senior Level	2 s.h.

Statistics and Actuarial Science

22S:39 Probability and Statistics for the Engineering and Physical Sciences	3 s.h.

Theatre Arts

49:13 Shakespeare	3 s.h.
49:60 Play Script Analysis	3 s.h.
49:62 Basic Playwriting	3 s.h.

Related Considerations

All courses numbered with the prefix 7 (College of Education) are considered to be in one department.

All courses numbered with the prefix 6 (College of Business Administration) except 6E (economics is also considered a department in the College of Liberal Arts) are considered to be in one department.

Honors

B.G.S. students qualify for membership in the College of Liberal Arts Honors Program by maintaining a cumulative grade-point average of at least 3.20. Graduating with honors usually includes the successful completion of the honors requirements in a particular department. A list of departmental requirements is available from the liberal arts honors program or from the B.G.S. coordinator.

B.G.S. students should initiate inquiries about graduating with honors by contacting the director of the College of Liberal Arts Honors Program at the Shambaugh House Honors Center. Students are encouraged to begin inquiries early in their junior year to allow time for foundation course work. The honors director offers suggestions for contacting a supervising faculty member or committee from one or several appropriate departments.

Career Considerations

Since the B.G.S. degree affords opportunities outside the traditional degree pattern, students must create programs of study that meet their individual educational and career objectives. Those who plan to seek employment immediately following graduation should familiarize themselves with the educational background and qualifications required by employers and should include appropriate courses in their programs of study.

Students preparing for advanced study should become familiar with the admissions requirements of graduate or professional schools. The earlier students decide on pursuing graduate or professional study, the easier it is for them to complete any necessary prerequisites.

B.G.S. students who design a cohesive program and maintain a competitive grade-point average may be considered equally with students who earn other undergraduate degrees for employment or admission to some graduate and professional schools.

For More Information

Information about the Bachelor of General Studies program is available from the Bachelor of General Studies/ Interdepartmental Studies Advisory Office, 113 Schaeffer Hall.

Courses

BGS:000 Cooperative Education Internship **0 s.h.**

GENETICS

Chair: George Stauffer (Microbiology)
Professors: Raymond Crowe (Psychiatry), John Donelson (Biochemistry), Michael Feiss (Microbiology), Joseph Frankel (Biology), Gary Gussin (Biology), James Hanson (Pediatrics), Victor Ionasescu (Pediatrics), Richard Maurer (Physiology and Biophysics), John Menninger (Biology), Roger Milkman (Biology), J. Dawson Mohler (Biology), Shivanand Patil (Pediatrics), William Rhead (Pediatrics), David Soll (Biology), Erich Six (Microbiology), Mark Stinski (Microbiology), C. Martin Stoltzfus (Microbiology), Chun-Fang Wu (Biology)
Associate professors: Wayne Carlson (Botany), Steven Clegg (Microbiology), Gordon Ginder (Internal Medicine), Jim Jung-Ching Lin (Biology), Robert Malone (Biology), Jeff Murray (Pediatrics), Lubomir Turek (Pathology), Wei-yeh Wang (Botany)
Assistant professors: Robert Deschenes (Biochemistry), Jan Fassler (Biology), Pamela Geyer (Biochemistry), Wayne Johnson (Physiology and Biophysics), W. Scott Moye-Rowley (Physiology and Biophysics), Rodney Nagoshi (Biology), David Price (Biochemistry), Andrew Russo (Physiology and Biophysics), Ming-Che Shih (Botany and Biology)
Graduate degree offered: Ph.D. in Genetics

Graduate Programs

The interdepartmental Ph.D. program in genetics is designed to promote collaborative investigation and intellectual interaction among students and faculty participants affiliated with several different departments.

Students who enroll in the program are encouraged to obtain a broad background in genetics, ranging from molecular to population genetics. Within this context, course requirements are flexible enough to permit students to tailor their formal course work to their individual needs.

All students enrolled in the program are required to take 99:130 Biochemistry and Molecular Biology II, 2:215 Genetics Seminar (same as 37:215, 61:215, 99:215), and either 37:171 Molecular Genetics or 142:210 Molecular Biology I. In addition, they must earn a total of at least 10 semester hours of credit in molecular and microbial genetics, cell and developmental genetics, and quantitative and population genetics.

Even more important than formal course work is the opportunity to do significant research in genetics. Students are encouraged to begin their own research as quickly as possible. Research interests of the participating faculty include virtually all areas of genetics, ranging from bacteriophage genetics to human medical genetics. In each area of genetics, there is a group of faculty members who have closely related interests. The University is also strong in several related disciplines, including microbial physiology, enzymology, virology, protein biochemistry, and developmental, cell, and population biology, all of which contribute significantly to the overall training program.

In addition to completing research and course work, students must pass a comprehensive examination, usually within their first two years in the program.

Admission

Prospective doctoral students in genetics should have a strong undergraduate background in science, including courses in general genetics, organic chemistry, introductory physics, and mathematics, as well as a strong commitment to genetic research and teaching. Students can makeup deficiencies in a particular area during their first year of graduate study.

Admission to the program is based on assessment of applicants' undergraduate academic record, performance on the Graduate Record Examination (GRE) Aptitude Test (verbal and quantitative), and letters of recommendation. Admission requirements are not rigid. Almost all students currently working toward the Ph.D. in genetics at The University of Iowa have undergraduate grade-point averages higher than 3.20, and their average GRE Aptitude Test scores (verbal plus quantitative) exceed 1300. Students with lower grade-point averages or GRE scores may be admitted, depending on other indications of academic potential.

The program accepts applications for admission at any time, but students generally begin graduate work during the fall semester.

Financial Aid

All genetics graduate students currently receive a financial stipend that is in the range of $11,000 plus tuition per year. By April 1, nearly all financial aid is committed for students entering in the fall.

Financial support comes from research assistantships, teaching assistantships, scholarships, individual research grants, or other departmental or college funds. All students are encouraged to do some teaching as part of their development as scientists and teachers.

Medical Scientist Training Program

Students may combine study toward an M.D. and a Ph.D. in genetics. Information about this program is available from the director of the Medical Scientist Training Program in the College of Medicine.

Departmental Ph.D. Programs

The Departments of Biochemistry, Biology, Botany, and Microbiology offer degree programs in which students may specialize in a particular aspect of genetics. See the appropriate departmental sections in the *Catalog* for information about these programs.

Courses

The following genetics courses are open to graduate students. Not all courses are offered every year.

99:130 Biochemistry and Molecular Biology II	4 s.h.
99:223 Gene Expression	1-2 s.h.
2:104 Cytogenetics	2 s.h.
2:160 Genetics and Biogenesis of Cell Organelles	3 s.h.
2:161 Plant Molecular Biology	3 s.h.
61:179 Bacterial Diversity	3 s.h.
61:268 Molecular Biology of Animal Viruses and the Eukaryotic Cell	3 s.h.
61:270 Topics in Molecular Biology	arr.
37:131 Evolution	4 s.h.
37:162 Population Genetics and Molecular Evolution	3 s.h.
37:171 Molecular Genetics	4 s.h.
37:172 Topics in Molecular Genetics	2 s.h.
37:173 Molecular Biology of Phage Lambda	3 s.h.
37:175 Topics in Evolutionary Genetics	1-2 s.h.
37:195 Pattern Formation in Development	2 s.h.
37:215 Genetics Seminar (same as 2:215, 61:215, 99:215)	0-2 s.h.
37:260 Developmental Genetics	2 s.h.
127:301 Graduate Research in Genetics	arr.
70:161 Human Genetics	2 s.h.
142:215 Molecular Biology II	3 s.h.

GEOGRAPHY

Chair: Michael L. McNulty
Professors: John W. Fuller, Joel L. Horowitz, James B. Lindberg, Michael L. McNulty, R. Rajagopal, David R. Reynolds, Gerard Rushton
Associate professors: Rex D. Honey, George P. Malanson, Frank H. Weirich
Assistant professors: Marc P. Armstrong, Claire Pavlik, Rebecca S. Roberts, Abdi Samatar
Adjunct faculty: Susan Cowart, Mickey Lauria, Thomas G. Newton, Carol A. Parsons
Undergraduate degrees offered: B.A., B.S. in Geography
Graduate degrees offered: M.A., Ph.D. in Geography

Geography seeks to explain spatial organization and areal differentiation through detailed studies of significant patterns and processes. The discipline is concerned with "place" or "environment" and ongoing forces that promote change within and between human and physical systems. Geography is a composite science, requiring a broad base of knowledge from many related disciplines. It also is an analytical science that seeks explanations of specific research questions from a distinctly geographic perspective.

Students who elect courses in geography find that they develop insights and methods of inquiry that are particularly applicable to understanding many of the complex problems confronting societies. For instance, the distribution and consumption of natural resources, air and water pollution, the growth and development of urban areas, increasing populations, transportation problems, spatial inequalities, location of services, and conflicts between nations are some of the issues dealt with during geographical training.

Studies in geography also provide students with concepts and methods for organizing such spatial units as urban areas, marketing regions, school districts, health service areas, drainage basins, and other areas of environmental concern. Thus, geographers can make substantial contributions toward understanding the behavior of individuals and of societies and their relations with the environment.

Career opportunities for majors in geography exist in many branches of government and in business. In demand are persons capable of dealing with resource management, regional development, market area analysis, and other problems related to the distribution and spatial interaction of physical, economic, social, and political phenomena.

Courses in geography are commonly required of students preparing to teach at the elementary and secondary school levels, those who want to work in urban and regional planning, and as a background for many related professions, including law, health care, environmental or transportation engineering, and business administration.

Undergraduate Programs

The geography faculty has developed an undergraduate instructional program that serves students interested in acquiring a major or minor in geography, as well as those concentrating in other disciplines who are interested in elective geography courses as part of a liberal education. The department also participates in interdepartmental programs involving global, urban, and environmental components.

Bachelor's Degrees

Each student majoring in geography selects one of the following three concentration areas: urban and regional studies, international development studies, or environmental studies.

Majors may work toward either a Bachelor of Science or Bachelor of Arts degree. Students who plan advanced training or careers in geography should elect the B.S. degree. Those pursuing a liberal arts objective may elect either the B.A. or B.S. degree.

General Requirements

All geography majors must complete one of the following computer programming courses:

22C:7 Introduction to Computing with FORTRAN	3 s.h.
or	
22C:16 Introduction to Programming with Pascal	4 s.h.

Bachelor of Science students must satisfy a mathematics requirement consisting of one of the following two pairs of courses:

22M:15 Mathematics for the Biological Sciences	4 s.h.
and	
22M:16 Calculus for the Biological Sciences	3 s.h.
or	
22M:25 Calculus I	4 s.h.
and	
22M:26 Calculus II	4 s.h.

or

22M:35 Engineering Calculus I 4 s.h.
and
22M:36 Engineering Calculus II 4 s.h.

Students may fulfill the computer programming and mathematics requirements by taking equivalent courses with objectives similar to these, with the consent of the geography faculty.

In addition, all geography majors must complete one of the three course sequences described below. Students are advised to pay close attention to the prerequisites of the intermediate and advanced courses in each sequence and to develop study programs that ensure timely satisfaction of the prerequisites of required courses. Prerequisites are stated in course descriptions. See "Courses" at the end of this section of the *Catalog*.

Urban and Regional Studies

The undergraduate program in urban and regional studies is designed for students who are preparing for positions in government and private business, graduate programs in geography, or professional programs such as urban and regional planning, business administration, applied policy analysis, or regional science.

The courses cover location theories and their application to applied problems, such as assessing sites for development potential, finding the best locations for public and private facilities, developing plans for regional and community development, evaluating alternate plans for improving transport services in a region, and forecasting the populations of small areas.

Methods for solving these applied problems are based on a thorough understanding of the processes of urban and regional development, the roles of individuals and institutions in effecting change, and the processes through which policy decisions are reached. Requisite skills are developed in quantitative analysis, cartography, development and management of geographical information systems, and computer methods. Opportunities for experience in working with real problems are included.

Students concentrating on urban and regional studies are required to complete the following sequence of courses. Prerequisites are listed in course descriptions. See "Courses" at the end of this section of the *Catalog*.

Introductory Courses

44:1 Introduction to Human Geography 4 s.h.
44:3 Introduction to Physical Geography 4 s.h.

At least one of these:

44:11 Introduction to Social Geography 3 s.h.
44:15 Introduction to Political Geography 3 s.h.
44:30 Introduction to Economic Geography 3 s.h.

Intermediate Courses

At least two of these:

44:130 Location Strategy of Firms 3 s.h.
44:132 Industrial Location 3 s.h.
44:133 Introduction to Transportation 3 s.h.
44:135 Urban Geography 3.s.h.

Methods Courses

All of these:

44:108 Statistical Methods of Geographical Analysis 3 s.h.
44:109 Computer Methods in Geographical Analysis 3 s.h.
44:150 Undergraduate Seminar for Geography Majors 3 s.h.

Advanced Courses

Students are required to take at least one course each from group A and B.

Group A

44:134 Methods of Transportation Analysis 3 s.h.
44:137 Economic Theory of Location 3 s.h.
44:139 Economic Analysis of Urban Spatial Structure 3 s.h.

Group B

44:166 Contemporary Europe: Interaction and Change 3 s.h.
44:171 Geography of the U.S. and Canada 3 s.h.
44:175 Locational Conflict 3 s.h.

International Development Studies

The concentration in international development studies is designed for students interested in the processes of economic, social, and political development, particularly as they affect the countries of the Third World. This concentration gives students a better understanding of regional and national development in international and cross-cultural perspective. Students who are interested in the problems of developing countries and who wish to examine competing theories of development intended to explain international and regional inequalities will find this concentration helpful.

Students concentrating on international development studies are required to complete the following sequence of courses. Prerequisites are listed in course descriptions. See "Courses" at the end of this section of the *Catalog*.

Introductory Courses

44:1 Introduction to Human Geography 4 s.h.
44:3 Introduction to Physical Geography 4 s.h.

Intermediate Course

44:94 International Development 3 s.h.

Methods Courses

44:108 Statistical Methods of Geographical Analysis 3 s.h.
44:109 Computer Methods in Geographical Analysis 3 s.h.
44:150 Undergraduate Seminar for Geography Majors 3 s.h.

Advanced Courses

44:194 Geographic Perspectives on Development 3 s.h.

At least two of these:

44:162 Planning and Geography of Underdevelopment 3 s.h.
44:163 Geography of the Newly Industrializing Countries 3 s.h.
44:172 Development Planning and Policy 3 s.h.

One of these:

44:161 African Development 3 s.h.
44:164 Geography of the Middle East 3 s.h.

Environmental Studies

The undergraduate program in environmental studies is designed for students who have career expectations or personal interest in resource management or environmental protection, or who are interested in physical geography. The program provides a knowledge of physical processes in landform development, atmospheric conditions, hydrology, soil development, and biotic communities. It stresses the interrelationships among those processes and helps students acquire knowledge necessary to assess the impact of human activities on physical systems.

Training in field observation, quantitative analysis, computer methods, and cartographic representation are included in this concentration. The program also provides a sound foundation for graduate- or professional-level studies. This undergraduate program has been designed as an introduction to the graduate-level physical geography and water resources subprogram of the Department of Geography.

Students concentrating in environmental studies must complete the following sequence of courses. Prerequisites to these courses are listed in course descriptions. See "Courses" at the end of this section of the *Catalog*. Students are required to take 15 semester hours of intermediate and advanced courses.

Introductory Courses

44:1 Introduction to Human Geography 4 s.h.
44:3 Introduction to Physical Geography 4 s.h.
44:19 Contemporary Environmental Issues 3 s.h.
29:5 Chemistry and Physics of the Environment 3 s.h.
(or a more advanced course in chemistry or physics)

Intermediate Courses

44:101 Climatology	3 s.h.
44:102 Earth Surface Processes	3 s.h.
44:103 Biogeography	3 s.h.
44:121 Natural Resources Policy	3 s.h.
44:122 Environmental Conservation in the United States	3 s.h.

Methods Courses

44:108 Statistical Methods of Geographical Analysis	3 s.h.
44:109 Computer Methods in Geographical Analysis	3 s.h.
44:150 Undergraduate Seminar for Geography Majors	3 s.h.

At least one of these:

44:107 Maps and Mapping	2 s.h.
44:113 Geographic Information Systems	3 s.h.

Advanced Courses

44:123 Landscape Ecology	3 s.h.
44:125 Environmental Impact Analysis	4 s.h.
44:126 Water in the Biosphere	3 s.h.
44:127 Water Quality Control Systems	3 s.h.
44:128 Drainage Basin: Form and Process	3 s.h.
44:129 Water Resources Management	3 s.h.
44:180 Field Studies	arr.

Courses in Other Departments

Under the direction of an adviser, students should select at least 12 semester hours of courses from one of the following clusters.

Biophysical Systems

2:100 Land Plants: An Evolutionary Survey	4 s.h.
2:111 Plant Ecology	4 s.h.
2:116 Field Ecology	4 s.h.
2:119 Plant-Animal Interactions	3-4 s.h.
37:133 Topics in Ecology	3 s.h.
12:108 Introduction to Oceanography	2 s.h.
12:110 Introduction to Remote Sensing	3 s.h.
12:128 Quaternary Palynology	5 s.h.
12:166 Hydrogeology and Groundwater Quality	3 s.h.
12:172 Glacial and Pleistocene Geology	3 s.h.
12:173 Quaternary Environments	3 s.h.
12:179 Engineering Geology	3 s.h.

Environmental Engineering

53:71 Principles of Hydraulics	2 s.h.
53:78 Principles of Hydrology	2 s.h.
53:152 Environmental Chemistry	3 s.h.
53:153 Environmental Chemistry Laboratory	3 s.h.
53:154 Environmental Microbiology	3 s.h.
53:155 Limnology	2-3 s.h.
53:178 Hydrometeorology	3 s.h.

Environmental Management

6E:1 Principles of Microeconomics	3-4 s.h.
6E:2 Principles of Macroeconomics	3-4 s.h.
6E:103 Microeconomics	3 s.h.
6E:105 Macroeconomics	3 s.h.
6E:119 Economics of the Government Sector	3 s.h.
6E:127 Natural Resources in the World Economy: Control and Conflict	2-3 s.h.
6E:133 Environmental Economics	3 s.h.
6J:100 Administrative Management	3 s.h.
6J:161 Individual Behavior in Organizations	3 s.h.
6J:163 Organizational Design and Operations	3 s.h.
102:101 Introduction to Planning and Policy Development	3 s.h.
53:204 Theories of Environmental Policy and Assessment	3 s.h.

Minor

To minor in geography, a student must complete at least 15 semester hours in geography courses with a minimum grade-point average of 2.00. Twelve of the 15 must be taken at The University of Iowa in 100-level courses. Minors are encouraged to select one of the department's three areas of concentration—urban and regional studies, international development studies, or environmental studies—and to take courses from those listed in that concentration. Minors who wish further assistance in selecting courses may contact the Departmental Secretary to request assignment of a minor adviser.

Honors

The honors major is for students of superior ability who want to pursue studies beyond the typical undergraduate level. To graduate with honors in geography, a student must be admitted to the College of Liberal Arts Honors Program as well as the honors program in geography by the first semester of the senior year, and must:

Maintain a grade-point average of 3.20 in all University work and a 3.40 in geography; and

Prepare and successfully defend an honors thesis.

The thesis consists of original research under the direction of a faculty member and is assessed by a three-member faculty committee.

Students complete the thesis through a year-long tutorial in 44:198 Honors Tutorial and 44:199 Honors Thesis. The senior course 44:150 Undergraduate Seminar for Geography Majors may be substituted for 44:199 Honors Thesis, provided the student continues work on the thesis under the direction of a faculty member.

Cooperative Education Program

The Department of Geography is a participant in the University's Cooperative Education Program, which provides opportunities for both undergraduate and graduate students to secure cooperative training assignments related to their academic programs.

Courses for the Nonmajor

Students in the College of Liberal Arts as well as other areas of the University may find geography courses meaningful to their own program of study. The beginning-level courses 44:1 Introduction to Human Geography, 44:11 Introduction to Social Geography, 44:19 Contemporary Environmental Issues, and 44:30 Introduction to Economic Geography are approved for the General Education Requirement in social sciences, 44:157 Third World Development Support is approved for the General Education Requirement in foreign civilization and culture, 44:161 African Development is approved for the General Education Requirements in social sciences and foreign civilization and culture, and 44:3 Introduction to Physical Geography is approved for the General Education Requirement in natural sciences. These courses serve as part of a liberal education.

Other courses also may be attractive as individual electives. These include 44:15 Introduction to Political Geography, 44:35 World Cities, 44:126 Water in the Biosphere, 44:128 Drainage Basin: Form and Process, 44:165 Geography of the Modern World, and 44:191 Energy in Contemporary Society.

Graduate Programs

The goals of the department's graduate programs are to prepare students to carry on creative and productive research in selected areas of geography involving the use and further elaboration of theory, and to prepare students for positions in research, teaching, or some area of applied geography. Success in achieving these goals has been demonstrated by the strong demand for University of Iowa graduates to fill positions on college and university faculties, in private research organizations, and in business and government.

The department offers specialized instruction in the teaching of geography at the college level for those pursuing academic careers. Opportunities are provided for all graduate students to gain practical teaching experience through service as departmental teaching assistants or graduate instructors.

Master of Arts

The department offers six M.A. subprograms: locational analysis, physical geography, political geography, regional development, transportation systems analysis, and water resources. These specialties are designed for students seeking positions in community planning, health planning, development planning in the Third World, water resources management, and transportation as well as for those who intend to pursue the Ph.D.

Each subprogram cuts across some of the more traditional breakdowns of the discipline and builds on the research specialties of the faculty. For example, topics of interest in urban geography are

included in three subprograms—locational analysis, political geography, and regional development—while the traditional concerns of economic geography are included in locational analysis and regional development. The more quantitative perspectives of regional science are included in locational analysis and transportation systems analysis. The subprogram in physical geography emphasizes interacting processes and integrates field studies with computer and simulation modeling. The water resources subprogram builds on foundations in environmental science and political economy.

Although M.A. students pursue a program of study within one of the subprograms, they also must gain a basic proficiency in another. The M.A. emphasizes the acquisition of analytical skills and their application in research. Courses that provide necessary training in oral and written communication, computer programming and graphics, statistics, mathematics, and research methods are integral to the M.A. program. Students in the transportation subprogram may take an additional elective course that enables them to receive a transportation certificate in addition to their M.A. degree.

General Requirements

The M.A. degree requires a minimum of 30 semester hours of graduate work, of which 15 semester hours must be in courses numbered 200 or above. In addition to fulfilling the course requirements in one of the department's six subprograms (see below), students must:

- Complete at least one course not in their own subprogram from the following introductory graduate courses: 44:121, 44:123, 44:125, 44:126, 44:128, 44:134, 44:137, 44:175, 44:194 or 44:210;
- Enroll in the department's general colloquium series (44:350 Research Seminar: Staff) during each semester in residence;
- Satisfy the department's B.S. degree requirements or their equivalents in mathematics, statistics, and computer programming; and
- Complete, with a grade of B or better, at least one 3-semester-hour quantitative methods course from a list of courses approved by the faculty.

The M.A. degree may be earned with or without thesis, except in the physical geography and water resources subprograms, which require a thesis. A maximum of 6 semester hours of credit may be earned for thesis work.

Students who elect the M.A. without thesis must pass a written examination and, in most subprograms, an oral examination. For students electing the M.A. with thesis, the written examination can be waived and the thesis defense serves as the oral M.A. examination.

Subprogram Requirements

Locational Analysis

44:134 Methods of Transportation Analysis	3 s.h.
44:137 Economic Theory of Location	3 s.h.
6E:202 Price Theory	3 s.h.
or	
6E:203 Microeconomics I	3 s.h.

Three of these:

44:216 Behavioral Analysis in Geography	3 s.h.
44:236 Travel Demand Modeling	3 s.h.
44:237 Urban Economics and Urban Spatial Structure	2 s.h.
44:285 Methods of Regional Analysis: Regional Science	3 s.h.
44:293 Advanced Location Theory	3 s.h.
44:330 Research Seminar: Location Theory	arr.

Physical Geography

44:123 Landscape Ecology	3 s.h.
44:128 Drainage Basin: Form and Process	3 s.h.
44:113 Geographic Information Systems	3 s.h.
44:328 Research Seminar: Physical Geography	arr.
*44:450 Thesis	arr.

Two of these:

44:226 Advanced Biogeography/ Landscape Ecology	3 s.h.
44:228 Advanced Earth Surface Processes	3 s.h.
44:225 Water Resources Systems Analysis	2-3 s.h.

Two from one of the following groups:

12:128 Quaternary Palynology and Paleobotany	5 s.h.
12:173 Quaternary Environments	3 s.h.
2:119 Plant-Animal Interactions	3-4 s.h.
or	
12:132 Sedimentology	3 s.h.
12:172 Glacial and Pleistocene Geology	3 s.h.
53:170 Flow in Open Channels	3 s.h.
53:173 Mechanics of Sediment Transport	2-3 s.h.
or	
53:152 Environmental Chemistry	3 s.h.
53:154 Environmental Microbiology	3 s.h.
53:155 Limnology	2-3 s.h.
53:251 Environmental Systems Modeling	3 s.h.
or	
Equivalent group of courses	

*M.A. thesis is required of all students in this subprogram.

Political Geography

44:175 Locational Conflict	3 s.h.
44:273 Social Theory and Human Geography	3 s.h.
6E:202 Price Theory	3 s.h.
44:210 Philosophy and Epistemology in Geography	2 s.h.
44:262 Political Economy of Regional Development	3 s.h.
44:270 Jurisdictional Organization/Public Service Provision	3 s.h.
44:315 Research Seminar: Political Geography	arr.

Regional Development

44:194 Geographic Perspectives on Development	3 s.h.
44:210 Philosophy and Epistemology in Geography	2 s.h.
44:262 Political Economy of Regional Development	3 s.h.
44:264 Agrarian Change and Rural Development in the Third World	3 s.h.
44:394 Research Seminar: Regional Development	3 s.h.

Transportation Systems Analysis

*22S:120 Probability and Statistics	4 s.h.
*6E:184 Introduction to Econometrics	3 s.h.
6E:202 Price Theory	3 s.h.
or	
6E:203 Microeconomics I	3 s.h.
44:134 Methods of Transportation Analysis	3 s.h.
44:236 Travel Demand Modeling	3 s.h.
102:260 Transportation Policy and Planning	3 s.h.
102:261 Problems in Transportation and Land Use	3 s.h.
53:262 Urban Transportation Planning	3 s.h.

*Satisfies the M.A. and Ph.D. quantitative methods requirements.

Water Resources

44:329 Research Seminar: Water Resources	arr.
44:450 Thesis (required of all students in the subprogram)	arr.

The following courses, with at least 9 semester hours earned at the 200-level:

One of these:

44:126 Water in the Biosphere	3 s.h.
44:128 Drainage Basin Form and Process	3 s.h.

Three of these:

44:121 or 44:221 Natural Resources Policy	3 s.h.
44:125 or 44:225 Environmental Impact Analysis/Water Resources Systems Analysis	2-4 s.h.
44:127 or 44:227 Water Quality Control Systems	3 s.h.
44:129 or 44:229 Water Resources Management	2-3 s.h.

An additional sequence of three courses in social theory and regional development, systems analysis, or biophysical processes, chosen under the direction of a faculty adviser; this sequence may include courses in other departments and may fill the out-of-subprogram requirement.

Students are expected to have an undergraduate background relevant to pursuing graduate work in one of the department's subprograms. The B.A. or B.S. degree in geography is not a prerequisite for entry into the program. A strong analytical background in any of the social or environmental sciences and an interest in exploring the regional and spatial perspectives characterizing modern geography are more important than the particular disciplinary orientation of the student's baccalaureate degree. Depending on the strength and suitability of their prior training, however, students may be required to take courses that are prerequisites for courses in their elected subprograms. Credit received for such courses cannot be applied toward the 30 semester hours required for the M.A. Each of the M.A. subprograms is designed to be completed in four semesters. This means that the student typically will accumulate 40 to 48 semester hours of graduate credit in completing the M.A. Students are advised to use these additional hours to elect graduate courses in other subprograms in geography and/or in other University departments and programs, thereby tailoring their programs of study to their individual interests.

Doctor of Philosophy

The Doctor of Philosophy program is designed to prepare students for positions in college and university teaching and in advanced research. It provides programs of study leading to broad knowledge of a field of geography and its literature and special expertise in a specific subfield. The former usually represents the general area in which the Ph.D. holder seeks employment, whereas the latter represents his or her area of most active research involvement. The Ph.D. is fundamentally a research degree and as such is constrained by the expertise of the faculty. At the Ph.D. level, the department is best known for its rigorous analytical orientation, particularly in the areas of locational analysis, spatial behavior, transportation, Third World regional development, urban political geography, physical geography, and water resources management.

The Ph.D. is a four- to five-year, postbaccalaureate program, the first two years of which are identical to the department's M.A. program. Students can enter the program with advanced standing corresponding to their previous graduate training equivalent to that in the department's M.A. program. Students entering the program directly from the B.S. or B.A. must fulfill all departmental requirements for the M.A. except for the M.A. examination. In addition, students whose ultimate objective is the Ph.D. are required to:

Complete at least 3 additional semester hours in graduate-level geography courses from those required or recommended for one of the department's subprograms that is not the student's general area of interest;

Complete at least one additional quantitative methods course (3 semester hours) that is at a level above that required for the B.S. degree and is chosen from a list of courses approved by the faculty (students in the Ph.D. program are advised to fulfill both the M.A. and Ph.D. quantitative methods requirements—a total of 6 semester hours—during their first year in residence);

Complete one additional research seminar under the direction of a faculty member who is not directing the research seminar satisfying the student's M.A. requirement; and

Register for the department's colloquium series, 44:350 Research Seminar: Staff, each semester that the student is in residence.

Before students can be admitted formally to candidacy for the Ph.D., they must submit an original research paper to the faculty for its approval. Students completing the M.A. with thesis can submit the M.A. thesis to fulfill this requirement. Students entering the program with an M.A. from another institution can submit theses or research papers completed elsewhere to fulfill the requirement. Students who initially enter the M.A. program with a terminal M.A. as their degree objective and who complete that program can enter the Ph.D. program by fulfilling the research paper requirement.

By the end of the M.A. portion of the program (typically the fourth semester for the student entering the program directly from the B.S. or B.A.), the student should submit a written report that includes an assessment of progress to date, an outline of the area of geography in which he or she intends to specialize, and a proposed plan of study for the remainder of his or her Ph.D. program. This report is prepared in consultation with the student's Ph.D. adviser and other members of the faculty in the student's general area. The plan of study is amended, as necessary, throughout the remainder of the student's program.

The remainder of the Ph.D. program includes the completion of the student's individual program of study designed to prepare him or her for a research career in a specific area of concentration. It consists of appropriate graduate courses, seminars, readings, and independent research in geography; courses in related disciplines; and courses that satisfy the tool requirements of the student's program of study.

Prior to taking the comprehensive examination consisting of both written and oral components, the student must submit an "area review paper" to his or her Ph.D. committee. This paper, which must be approved by the student's Ph.D. adviser, consists of a critical review of research in the student's area of concentration. As such, it is a culminating step in a student's program of study as well as a statement of future research directions. The comprehensive examination covers both the student's area of concentration and his or her more general field in the discipline. After obtaining the approval of a dissertation supervisor, the student must submit a dissertation proposal to his or her dissertation committee for its critical comments and approval. The student must then complete and defend the dissertation.

Before receiving the Ph.D. degree, students are expected to serve as both classroom instructors (or teaching assistants) and research assistants.

Admission

In addition to the general rules and regulations set forth in the *Manual of Rules and Regulations of the Graduate College*, the department considers the applicant's undergraduate grade-point average, especially of his or her junior and senior years; scores on the Graduate Record Examination (GRE) General Test; three letters of recommendation; and an essay in which the applicant sets forth the reasons for wanting to study geography at The University of Iowa.

Ordinarily, applicants must have earned an undergraduate grade-point average of 3.00 or better to be admitted to either the M.A. or Ph.D. program in geography.

Students from foreign countries or from undergraduate institutions that evaluate students on a basis other than grade-point average will be considered according to academic standing in their respective institutions.

Financial Aid

A number of graduate appointments as teaching or research assistants are available. Awards are based on merit. Students usually must have a combined score of 1100 on the GRE General Test verbal and quantitative sections and a 3.00 undergraduate or graduate grade-point average to be appointed to an assistantship. Applications for graduate appointments should be received by February 15.

Facilities

The department houses a laboratory for computer cartography and spatial analysis equipped with PC-compatible and Macintosh work stations, digitizers, and plotters. These workstations support a variety of GIS software packages including ERDAS, IDRISI, MAP, MAPINFO, and Transcad. The department also participates in an advanced GIS facility in the Center for Global and Regional Environmental Research. The PCs and other terminals in the department are linked to the University's SYTEK broadband communication network, which provides high-speed access to graphics, data management, and analysis software on University IBM, PRIME, and VAX computer systems.

Students also have access to a University computing cluster that contains IBM PCs, terminals, several printers, and a plotter. It

is located on the same floor as the department offices.

For studies in water resources and physical geography, the department has laboratories for analysis of vegetation, sediment, soil, and water quality; a field station in California; and a variety of field equipment ranging from electronic data loggers to boats.

The map collection in the Main Library contains more than 115,500 maps, a total of 3,600 atlases and reference works, and about 100,000 aerial photographs, primarily of Iowa. The library is a depository for maps of the U.S. Army Topographic Command, formerly the Army Map Service.

The Geology Library contains approximately 70,000 maps, including both geologic maps and U.S. Geological Survey topographic maps. The Department of Geography has its own collection of topographic maps, maps of large urban centers, and aerial photographs for use by students in laboratory exercises.

Courses

Primarily for Undergraduates

44:000 Cooperative Education Training Assignment **0 s.h.**

44:1 Introduction to Human Geography **4 s.h.**
Application of geographic principles to contemporary social, economic, and political problems; urban growth; problems of the ghetto; diffusion of innovations; territoriality and perception. GER: social sciences.

44:3 Introduction to Physical Geography **4 s.h.**
Elementary principles of physical geography: physics of weather and climate, hydrological systems, geomorphological and geological forces, pedological processes and spatial factors in vegetation distribution; geographic explanation of physical environment, with principles applied to the human use system; environmental pollution and natural hazards. GER: natural sciences.

44:11 Introduction to Social Geography **3 s.h.**
Spatial considerations of population growth and distribution; minorities within a population; poverty; housing; social organization and disorganization; social systems including education, religion, recreation, medical and social services; diffusion of ideas and traits over space. GER: social sciences.

44:15 Introduction to Political Geography **3 s.h.**
Geographic principles applied to political and economic problems at international, national, and local levels; topics include regional disparities in social well-being, service outputs of governments, political dimensions of environmental quality, spatial organization of political systems.

44:19 Contemporary Environmental Issues **3 s.h.**
Problems associated with population growth, technology, and resource consumption; protection of natural, historic, and cultural resources; air pollution; water pollution; energy and environment; alternative approaches to the resolution of environmental problems; real world case studies. GER: social sciences.

44:30 Introduction to Economic Geography **3 s.h.**
Location and spatial organization of the world's major types of economies; agriculture, energy and minerals, manufacturing, transportation; trade and service centers. GER: social sciences.

44:35 World Cities **3 s.h.**
Introductory course on urban geography examining urbanization as a process through lectures, films, readings, and discussions; specific concepts and theories of urbanization through global patterns, regional urban systems, and individual metropolitan areas. Offered spring semesters.

44:94 International Development **3 s.h.**
Theories of international development, political economy, development policy and planning; empirical analysis of conditions, policies and experiences of selected Third World countries. Prerequisite: 44:1.

44:100 Readings for Undergraduates **arr.**
Supervised readings in geography. Consent of instructor required.

For Undergraduates and Graduates

44:101 Climatology **3 s.h.**
Boundary layer processes that drive atmospheric dynamics; exchanges of energy and water at simple and complex surfaces; global climate change records, theories, models; impacts of climate on society. Prerequiste: 44:3 or consent of instructor.

44:102 Earth Surface Processes **3 s.h.**
Overview of the basic geomorphic and environmental processes that shape the surface of the earth; emphasis on processes of weathering: mass movement such as creep, landslides, and earth flow; erosion, transport, and deposition by fluid agents such as wind, water, and ice; methods used to study these physical processes. Prerequisite: 44:3 or a course in geology. Same as 12:102.

44:103 Biogeography **3 s.h.**
Distribution and abundance of plants and animals, spatial patterns and processes, and temporal dynamics of succession, response to climate change, and evolution; methods applied to the study of vegetation and plant community patterns. Prerequisite: 44:3 or 2:1 or consent of instructor. Same as 2:103.

44:107 Maps and Mapping **2 s.h.**
Qualities of a good map or diagram; types of maps or diagrams for particular uses; major types of cartographic presentations; available tools for constructing maps and diagrams; procedures for the compilation of maps and diagrams; laboratory experiences in compiling maps and diagrams.

44:108 Statistical Methods of Geographical Analysis **3 s.h.**
Geographical data sources, data collection, spatial sampling, survey methods, descriptive spatial statistics, probability, inference, contingency analysis, variance analysis, linear regression, residual mapping, polynominal trend surface analysis, graphing, and presentation.

44:109 Computer Methods in Geographical Analysis **3 s.h.**
Use of computer mapping as a tool in geographic analysis; various mapping programs including SYMAP, CALFORM, and others. Prerequisite: 22C:7 or 22C:16 or consent of instructor.

44:110 Spatial Organization **3 s.h.**
Approaches to spatial analysis of human activities and natural processes. Offered fall semesters.

44:113 Geographic Information Systems **3 s.h.**
Survey of issues important to the establishment of geographic information systems: spatial data encoding, raster-vector options, spatial and attribute resolution, cartographic data models, linkages to spatial analysis procedures, display techniques for decision support, institutional setting. Prerequisite: 44:109.

44:121 Natural Resources Policy **3 s.h.**
Geographic, cultural, political, economic, and ethical dimensions of natural resources policy; substantive and theoretical insights from the natural sciences, social sciences, and humanities in building a conceptual framework for the analysis of current resource problems from a geographic perspective; U.S. natural resource problems and policy questions. Prerequisite: 44:19 or consent of instructor.

44:122 Environmental Conservation in the United States **3 s.h.**
Varied natural environments of the United States and problems arising from conflicting land uses; consideration of public land use policy, environmental impacts of different land uses, and problems of habitat preservation and endangered species. Prerequisite: 44:3 or 44:19 or consent of instructor.

44:123 Landscape Ecology **3 s.h.**
Effects of spatial pattern on spatial processes in ecology; characteristics of matrix, patch, and corridor; fragmentation, deforestation, habitat loss; spatial flows of energy, matter, and genetic information; relationship to human impact and global climate change. Prerequisites: 44:103 or a 100-level course in ecology, and 44:108.

44:125 Environmental Impact Analysis **4 s.h.**
Environmental impact assessment methodologies; emphasis on cost-benefit-risk analysis, overlay and graphic techniques, optimal resource use, and system simulation; field trips to local environmental control facilities. Prerequisites: 44:19, and 29:5 or equivalent.

44:126 Water in the Biosphere **3 s.h.**
Biotic aspects of water resources production and the geographical basis of physical processes in drainage basins; spatial aspects of lotic dynamics and regional characterization of wetland structure and process. Prerequisite: 44:101 or 44:102 or 44:103 or 2:111.

44:127 Water Quality Control Systems **3 s.h.**
Geographical perspectives in the study and interpretation of chemicals in water; primary and secondary drinking water standards; local, regional, national, and international case studies in drinking water and health; socioeconomic and institutional considerations in designing water quality protection strategies. Prerequisites: 44:108 and senior standing, or consent of instructor.

44:128 Drainage Basin: Form and Process **3 s.h.**
Hydrological principles, stream channel processes, and fluvial geomorphology within the drainage basin system: spatial and temporal variations in water distribution, analyses of hydrological data, flow mechanisms, sediment transport, forecasting procedures, hydrograph construction and modeling. Prerequisites: 44:108, and 44:102 or a 100-level geology or hydraulics course.

44:129 Water Resources Management **3 s.h.**
Application of hydrological information in water resources management; aspects of water quantity and quality, groundwater availability, water use and treatment, resource development, political and administrative issues, and basin management problems—forestry, agriculture, urbanization, floods, and droughts. Prerequisite: 44:108, and 44:121 or a 100-level political economy course.

44:130 Location Strategy of Firms **3 s.h.**
Theory and methods used by public and private sector firms to geographically organize their activities; market selection, site analysis, small-area demand forecasting and sales forecasting, network development, delivery of urban and rural services; use of geographical models of spatial interaction and spatial choice; spatial allocation; location-allocation models; districting and dispatching models; route-distance functions; multi-attribute preference elicitation and spatial competition. Prerequisite: 44:108 or 6K:70.

44:131 Medical Geography: Health Services **1-3 s.h.**
Provision of health care in selected countries, with particular reference to the Third World; focus on problems of geographical, economic, and cultural accessibility to health services; other topics include disease ecology, prospective payment systems, privatization, and medical pluralism; includes regional case study.

44:132 Industrial Location **3 s.h.**
Theory and practice of manufacturing location and its application to different industries and types of economy; investigations of selected case studies.

44:133 Introduction to Transportation **3 s.h.**
Overview of transportation markets—intercity, rural, and urban—and transportation modes—railroads, highways, air carriage, and waterways; discussion of regulation, finance, and physical distribution issues. Same as 102:133, 6E:145.

44:134 Methods of Transportation Analysis **3 s.h.**
Conceptual basis for predicting effects of transportation policy measures on traffic flows and system performance; transportation measurements; introduction to travel demand modeling; introduction to system performance modeling, network analysis, and equilibration. Prerequisites: graduate standing, or 44:108 and a previous transportation course. Same as 102:134.

44:135 Urban Geography **3 s.h.**
Models of urban growth and urban forms; spatial patterns of selected activities; processes that generate these patterns; current problems. Prerequisite: 44:1.

44:137 Economic Theory of Location **3 s.h.**
Behaviorally based location theories for social and economic activities traced from their classical origins to the contemporary literature where both descriptive (e.g., central place theory) and prescriptive (e.g., location-allocation) models of multiple location decisions exist; the relationship between location-allocation models and competitive location theory. Prerequisites: 6E:1 or

graduate standing, and 44:30 or 44:132; or consent of instructor.

44:138 Health and Development 3 s.h.
The intricate relationship between health status, health services, and socioeconomic development in the Third World; health implications of socioeconomic policies and planning analyzed through economic and health development theories. Open only to seniors and graduate students.

44:139 Economic Analysis of Urban Spatial Structure 3 s.h.
Use of the methods of economics to understand urban spatial structure; central place theory, why cities exist and trade with one another; theoretical models to explain spatial patterns of population, land use, and rents within cities; empirical tests of models; applications of theory to practice policy issues such as urban sprawl, racial segregation, transportation planning. Prerequisites: 44:108 and 44:135.

44:150 Undergraduate Seminar for Geography Majors 3 s.h.
Participation in a term project and preparation of a documented report. Offered spring semesters. Open only to seniors. Prerequisites: 44:108, 44:109, and satisfaction of computer programming requirement.

44:157 Third World Development Support 3 s.h.
Critical analysis of theories, policies, programs, and practices of Third World development; nature of the social scientific support needed to understand and to accelerate the process; analysis of historical trends in the administration of organized development aid since its inception in 1945. GER: foreign civilization and culture. Same as 19:157.

44:161 African Development 3 s.h.
Problems of economic, political, and spatial integration in Africa; patterns and processes of economic development and nation building. GER: foreign civilization and culture, social sciences. Prerequisite: 44:94. Same as 30:146, 141:146.

44:162 Planning and Geography of Underdevelopment 3 s.h.
Spatial implications of the economic, social, and political institutions affecting contemporary Third World countries; political economy of development and underdevelopment studied through reading major theoretical works and analyzing case studies. Prerequisite: 44:94 or graduate standing. Same as 102:162.

44:163 Geography of the Newly Industrializing Countries 3 s.h.
The newly industrializing countries (NICs) in geographic and historical perspectives; U.S. manufacturing base as a backdrop in the NICs' industrialization; topics include off-shore industrial production, women in development, import-substitution industrialization (ISI), export-led industrialization, theories of industrial location, high-technology industries, and the international division of labor; regional profiles taken from the Pacific Rim, Chile, Brazil, and the northern Mexican maquila industry. Prerequisites: 44:94 and 44:108.

44:164 Geography of the Middle East 3 s.h.
Examination of the social, political, and economic geography of the Middle East within countries, among countries of the region, and between the region and the rest of the world. Prerequisite: 44:94.

44:165 Geography of the Modern World 3 s.h.
Conceptualization of the world as an increasingly interconnected system; similarities and differences in the ways diverse regions participate in the changing world.

44:166 Contemporary Europe: Interaction and Change 3 s.h.
Examination of contemporary Europe, stressing societies' problems and attempts to resolve them; interactions within and among European countries, and between Europe and the rest of the world. Prerequisites: 44:15 or 44:30, and 44:135.

44:167 Patterns of Urbanization and Development in Latin America 3 s.h.
Change in Latin America examined through the processes of urbanization; perspectives from modernization and human ecological, dependency, and neo-Marxist theories of development; topical aspects include informal economies, women in development, housing, residential segregation, squatter settlements, and urban-ecological views of the Latin American city.

44:168 Icelandic Studies 2 s.h.

44:169 Latin American Studies Seminar 3 s.h.
Redemocratization in the Southern Cone (Brazil, Uruguay, Argentina, and Chile); effects of authoritarianism on society and state.

44:170 Political Organization of Space 3 s.h.
Geographical aspects of jurisdictional organization, provision of public services, location of public facilities, geography of elections, and public policy.

44:171 Geography of the U.S. and Canada 3 s.h.
Historical, contemporary perspectives on the economic, social, political, and physical environments of the United States and Canada and their principal regions. Prerequisites: 44:15 or 44:30, and 44:135.

44:172 Development Planning and Policy 3 s.h.
Explicit and implicit strategies for economic and social development: origins, goals, formulation, execution, results; policy analysis methods. Prerequisites: 44:94 and 44:108.

44:175 Locational Conflict 3 s.h.
Behavioral and institutional bases of locational conflict, with emphasis on public choice, social justice, and radical perspectives; politicizing processes; strategies of resolution in selected contexts—environmental management, urban infrastructure, public education, service provision. Prerequisites: 44:15 and 44:135.

44:180 Field Studies arr.
Problem definition and research design in a field setting; sampling procedures, collection of primary data, data analyses and interpretation; topics encompass the spectrum of geographic discipline. Prerequisite: 12 semester hours of courses in geography or consent of instructor.

44:191 Energy in Contemporary Society 3 s.h.
Technical, legal, economic, and behavioral issues in energy production, delivery, and use; emphasis on cross-disciplinary implications of energy systems. Prerequisite: junior, senior, professional, or graduate status.

44:194 Geographic Perspectives on Development 3 s.h.
Theoretical and empirical studies of the regional development process, with special emphasis on developing countries; alternative regional development theories and changes in development theories as evidenced in the literature of geography and related disciplines. Prerequisite: prior or concurrent satisfaction of all other international development track requirements.

44:195 Latin American Economic Development 3 s.h.
Structural conditions of post-World War II regional development in Latin America; import-substitution industrialization strategies, regional integration schemes, and debt repayment. Part of the Summer Social Science Program in Chile.

44:196 State and Society in the Southern Cone 3 s.h.
The rise of authoritarianism and the transition to democracy in the region, particularly in Chile; relationship between regimes and elements of civil society, such as political parties, the church, and the labor movement, in understanding the Southern Cone. Part of the Summer Social Science Program in Chile.

44:197 Summer Social Science Program in Chile—Independent Study 3 s.h.
Health care financing, residential segregation, public policy analysis, and other topics of faculty expertise; research paper based on archival or field investigation in Santiago.

44:198 Honors Tutorial arr.
Individual study for honors majors. May be repeated.

44:199 Honors Thesis arr.
Supervised original research project leading to written thesis and oral defense. Open only to honors students.

For Graduates

44:200 Readings arr.
Supervised readings by graduate students in topics of their choice. Consent of instructor required.

44:210 Philosophy and Epistemology in Geography 2 s.h.
Analysis of philosophies and methodologies of modern geography, with emphasis on epistemological and ontological issues; discussion of positivism (empiricism), its variants, and alternatives, in light of past and current research.

44:211 Advanced Quantitative Methods 3 s.h.
Nonregression statistical methods used in current geographical research: discriminant analysis, factor analysis, multivariate hypothesis testing, models with simultaneous equations; assumes knowledge of ordinary regression techniques. Prerequisite: 22S:157 or 22S:152 or 6E:184.

44:216 Behavioral Analysis in Geography 3 s.h.
Relationship between human behavior and the social and physical environment; environmental perception, mental maps, spatial cognition, and spatial choice models; preference structures, utility theory, and decision making by individuals or groups in relation to the geographical organization of activities.

44:221 Natural Resources Policy 3 s.h.
Advanced analysis of natural resources policy processes from geographic perspective; theoretical insights from social sciences incorporated to build framework for analyzing U.S. natural resources problems, with emphasis on cultural, political economy, and ethical dimensions of policy; analysis of current natural resources policy issues to illustrate the application of concepts developed.

44:225 Water Resources Systems Analysis 2-3 s.h.
Linear optimization and continuous system simulation models; recent applications in water resources management, pollution control, economics, and public policy; potential future applications in designing water quality monitoring networks. Consent of instructor required.

44:226 Advanced Biogeography/Landscape Ecology 3 s.h.
Current questions on spatial distribution of organisms and effect of spatial structure on ecological processes over landscape.

44:227 Water Quality Control Systems 3 s.h.
Geographical perspectives in the study and interpretation of chemicals in water; primary and secondary drinking water standards; local, regional, national, and international case studies in drinking water and health; socioeconomic and institutional considerations in designing water quality protection strategies.

44:228 Advanced Earth Surface Processes 3 s.h.
Theoretical concepts and empirical studies of hydrologic, climatic, and geomorphic processes as related to the earth's surface: measurement, analysis, and modeling; drainage basin analysis and modeling; responses to climatic and environmental change. Prerequisite: strong background in physical geography or consent of instructor. Same as 12:228.

44:229 Water Resources Management 2-3 s.h.
Theoretical concepts and empirical studies of water management problems: application of hydrological data to water problems, including water quantity and water quality issues, groundwater availability, water treatment development policies, political and administrative considerations, and drainage basin management programs. Prerequisite: 44:228 or consent of instructor.

44:236 Travel Demand Modeling 3 s.h.
Mathematical and statistical background for travel demand modeling; choice theories; random utility models; econometric methods for the multinomial logit and related models; applications of random utility models to travel demand forecasting; demand/performance equilibration. Prerequisite: 6E:184 or 6E:221. Same as 6E:226.

44:237 Urban Economics and Urban Spatial Structure 2 s.h.
Economic models of urban land use and rents, racial segregation in housing; measuring the benefits of pollution control, crime control, and public school quality, choice of residential location, decline and revitalization of city centers.

44:262 Political Economy of Regional Development 3 s.h.
The "unequal" relationship between Third World countries and the industrial world, and contemporary development problems of Third World societies; form and function of the Third World-industrial world relationship, in both external and internal dimensions. Consent of instructor required.

44:263 Industrial Location and Regional Development in Latin America 3 s.h.
Conceptual approaches drawn from structuralist, dependency, neo-Marxist, and neoclassical perspectives on regional development; case strategies; topics include methods of industrial location, female labor force participation, automotive industry, spatial perspectives on industrialization, informal economies, research and development, import substitution, and foreign debt.

44:264 Agrarian Change and Rural Development in the Third World 3 s.h.
Introduction to classical and contemporary theories that inform rural development projects and programs; historical roots of contemporary rural development thinking; in-depth research paper on the nature of rural development in a Third World nation.

44:265 Transportation Regulation and Finance 3 s.h.
Public policy options for improving passenger and commodity movements within and between cities, as these policies relate to air, water, and land-based transportation modes. Same as 102:265.

44:270 Jurisdictional Organization/Public Service Provision 3 s.h.
In-depth examination of literatures dealing with geographical aspects of jurisdictional organization, provision of public services, location of public facilities, geography of elections, and public policy.

44:272 Social Theory: Social Movements and the Local State 3 s.h.
Literatures on social theory, territoriality, and relations between national states and their subnational divisions; Marxist and non-Marxist social theories; alternative conceptualizations of territoriality; examination of jurisdictional organization of space in both Western and non-Western contexts.

44:273 Social Theory and Human Geography 3 s.h.
Assumption that space is a socially produced and reproduced commodity that gains value as it enters the production process; how space enters production vis-a-vis forces that circumscribe larger societal relationships; production and reproduction of social space in a capitalist economy.

44:275 Development Policy and Planning in the Third World 3 s.h.
Interdisciplinary seminar; focus on comparing development policies and planning in Third World countries; important development problems and alternative perspectives on problems and proposed solutions. Same as 113:275, 6E:234, 42:275, 34:275, 102:275, 7F:275.

44:280 Advanced Field Studies arr.
Problem definition and research design in a field setting at the graduate level; sampling procedures, collection of primary data, data analyses, and interpretation; may encompass the spectrum of geography; can be tailored to individual requirements. Consent of instructor required.

44:285 Methods of Regional Analysis: Regional Science 3 s.h.
Methods of regional science, including input-output, interregional input-output, econometric and regional economic growth models; emphasis on theoretical foundations and applications to forecasting and policy impact analysis.

44:286 Methods of Regional Analysis: Population Geography/Demography 3 s.h.
Methods of population geography and demography, including migration and multiregional demographic models; models of population growth and spatial interaction; interregional economic-demographic models; emphasis on theoretical foundations and applications to forecasting.

44:290 Regional Development: Theory and Policy 3 s.h.
Methods of regional science, including input, output, and econometric models; migration and multiregional demographic models; spatial interaction modeling; interregional economic-demographic models; emphasis on theoretical foundations and applications to forecasting and impact analysis. Same as 6E:290, 102:290.

44:293 Advanced Location Theory 3 s.h.
Economics of location; location of the firm; transportation cost and location; location-allocation models; spatial price theory. Consent of instructor required. Prerequisite: 6E:202 or 6E:203. Same as 6E:293.

44:308 Research Seminar: Quantitative Methods, Computer Methods, and Modeling 2-3 s.h.

44:315 Research Seminar: Political Geography arr.

44:328 Research Seminar: Physical Geography arr.

44:329 Research Seminar: Water Resources arr.

44:330 Research Seminar: Location Theory arr.
Critique of the contemporary location theory literature; discussion of solutions to the problems identified. Prerequisite: 44:137.

44:337 Seminar: Urbanization arr.
Problems and consequences of urbanization processes: political, economic, and social study of metropolitan areas. May be repeated. Same as 34:279, 7D:301, 30:324.

44:350 Research Seminar: Staff arr.

44:394 Research Seminar: Regional Development 3 s.h.

44:406 Research: The Teaching of Geography arr.

44:440 Research: Environmental Systems Analysis arr.

44:441 Research: Locational Analysis arr.

44:450 Thesis arr.

GEOLOGY

Chair: Holmes A. Semken
Professors: Richard G. Baker, Robert S. Carmichael, Lon D. Drake, Brian F. Glenister, Philip H. Heckel, Richard A. Hoppin, Gilbert Klapper, George R. McCormick, Holmes A. Semken, Keene Swett
Professors emeriti: William M. Furnish, Sherwood D. Tuttle
Associate professors: Robert L. Brenner, Ann F. Budd, C. Thomas Foster, Jr.
Assistant professors: Luis A. Gonzalez, Mark K. Reagan
Adjunct professors: G. Brian Bailey, George R. Hallberg, Donald L. Koch
Adjunct assistant professors: Gregory A. Ludvigson, R. Sanders Rhodes II, Brian J. Witzke
Research associate: Julie Golden
Undergraduate degrees offered: B.A., B.S. in Geology
Graduate degrees offered: M.S., Ph.D. in Geology

Geology is the basic study and practical application of scientific disciplines related to understanding the earth. Geological concerns include the earth's origin, its present appearance and character internally and at the surface, its alteration with time, location of economic and energy resources, and how man is changing the earth for future generations. The Department of Geology has the customary subfields—mineralogy, petrology, stratigraphy, structural geology, paleontology, sedimentology, economic geology, geomorphology, glacial geology, environmental geology—as well as applied geophysics, geochemistry, paleobiology, and remote sensing.

Career opportunities are available to professional geologists in industry (especially related to environmental concerns), education, urban planning, state and federal geological surveys, and government, resource, and research organizations. The master's degree is regarded by most hiring agencies as the working degree in geology. However, an undergraduate degree is fully satisfactory in certain teaching, federal, and industrial situations.

Many of The University of Iowa's geology graduates find employment with the petroleum industry in exploration geology and geophysics. Others continue in graduate school or take jobs with government or conservation agencies. Some intend to enter law, business, or other fields such as urban planning, environmental studies, engineering, archaeology, science education, or oceanography as advanced areas. Geology is suited to all of these.

The program puts greater stress on the basic aspects of geology than on the engineering or agricultural phases of the discipline. The department specializes in relating scientific thought to the study of the earth. Its resources include a major paleontology facility (invertebrate, vertebrate, palynology), a terminal link to the Weeg Computing Center, the Geological Survey Bureau (located in the same building as the department), and research equipment for fields such as mineralogy, petrology (igneous, sedimentary, and economic), remote sensing, and exploration geophysics.

Geology majors receive at least an academic year's work in three allied scientific areas—physics, chemistry, and mathematics—and a semester of biology in addition to a course in each major area of geology.

Each year more than 700 students enroll in 12:23 Earth History and Resources and 12:24 Introduction to Environmental Geology, team-taught, laboratory-lecture courses designed to fulfill the College of Liberal Arts General Education Requirement in natural science.

For nonmajors, the department offers a lecture sequence featuring a general survey of geology and several advanced courses with few prerequisites—paleontology, geology of Iowa, remote sensing, geomorphology, and oceanography.

Undergraduate Programs

Students majoring in geology must meet the general requirements of the College of Liberal Arts. It is recommended that they satisfy the foreign language requirement with French, German, or Russian, and the social science requirement with approved courses in economics, geography, and/or anthropology.

Bachelor of Science

The Bachelor of Science professional program in geology is designed primarily as preparation for graduate study and for employment in industry. The following courses are required.

*12:5 Introduction to Geology	4 s.h.
*12:6 Evolution of the Earth	4 s.h.
12:41 Mineralogy	4 s.h.
12:52 Elementary Petrology	4 s.h.
12:92 Structural Geology	5 s.h.
12:93 Geologic Field Methods	2 s.h.
12:113 Summer Field Course	6 s.h.
12:121 Principles of Paleontology	3 s.h.
At least two elective geology courses	6 s.h.

Total	At least 38 s.h.

*Students may substitute 12:23 Earth History and Resources for 12:5 Introduction to Geology and 12:4 Evolution and the History of Life for 12:6 Evolution of the Earth.

The geology major requires at least 10 semester hours of college mathematics, including 22M:26 Calculus II or 22M:36 Engineering Calculus II. Computer science or statistics courses may be counted toward the 10-semester-hour requirement. Additional mathematics courses are strongly recommended.

Eight semester hours of physics, 8 semester hours of chemistry, and a course with a lab in a biological science also are required.

Bachelor of Arts

The Bachelor of Arts program, divided into general education and environmental geology tracks, is designed to provide a varied background in geology and a broader choice of electives than is available in the B.S. program. The B.A. degree is for students who are interested in the fundamentals of geology or in interdisciplinary environmental programs.

General Education Track

The general track provides a background in geology and allied fields applicable for careers in conservation, urban planning, or preprofessional training. With appropriate course work in education, the B.A. program also provides a base for high school or community college teaching in earth science. See the "College of Education" section of the *Catalog*. The following courses are required.

*12:5 Introduction to Geology	4 s.h.
*12:6 Evolution of the Earth	4 s.h.
12:41 Mineralogy	4 s.h.
12:52 Elementary Petrology	4 s.h.
12:121 Principles of Paleontology	3 s.h.
12:116 Field Trip (two sections)	4 s.h.
Geology electives	12 s.h.
Total	35 s.h.

*Students may substitute 12:23 Earth History and Resources or 12:24 Introduction to Environmental Geology for 12:5 Introduction to Geology, and 12:4 Evolution and the History of Life for 12:6 Evolution of the Earth.

The B.A. in geology requires at least 10 semester hours of college-level mathematics, which may include computer science or statistics. Eight semester hours of chemistry are also required, and courses in other sciences and social sciences appropriate to the student's objectives are recommended.

Environmental Track

Students who are concerned with environmental issues or are interested in career opportunities in solving environmental problems have the option of pursuing a B.A. degree via an environmental geology track. This track is divided into a basic program for those who wish to become informed and fully appreciate environmental issues (e.g., for journalism, government, and education), and an enriched program for those who wish to be employed as environmental geologists. The enriched track has been further subdivided into engineering geology, geobiology, geochemistry, and hydrogeology specializations.

The department encourages students who are interested in either of these options to obtain the detailed outline for the environmental track from the geology office, 121 Trowbridge Hall, or the Undergraduate Academic Advising Center.

Minor

A minor requires at least 15 semester hours of geology courses with a minimum grade-point average of 2.00. 12:23 Earth History and Resources and 12:24 Introduction to Environmental Geology may be counted as courses in geology.

At least 12 of the 15 semester hours must be earned in advanced geology courses taken at The University of Iowa. All geology courses numbered 100 and above, except 12:103 Physical Geology and 12:104 Historical Geology, may be taken as advanced courses. In addition, 12:41 Mineralogy, 12:52 Elementary Petrology, and 12:92 Structural Geology are considered advanced courses for the minor.

College-level courses in mathematics, physics, chemistry, and biology usually are required as collateral work for geology students. Those seeking a minor in geology should be sufficiently prepared in the areas of supporting sciences before they take advanced courses in geology.

Recommended advanced courses in geology that deal with important areas of earth materials and earth processes are:

12:41 Mineralogy	4 s.h.
12:52 Elementary Petrology	4 s.h.
12:92 Structural Geology	5 s.h.
12:121 Principles of Paleontology	3 s.h.
12:132 Sedimentology	3 s.h.
12:161 Principles of Stratigraphy	3 s.h.
12:180 Solid-Earth Geophysics	3 s.h.

Joint Programs

Joint programs can be arranged, usually with chemistry, physics, biology, and anthropology.

Original Research

A junior or senior who is ready to pursue original research for credit in geology may assist a faculty member or graduate student with a current research project or may initiate a small-scale project involving a combination of field, laboratory, and library investigation. Independent study is encouraged. Undergraduate classes have produced term reports that subsequently were published.

Honors

A degree with honors in geology is offered. Students in the honors program can elect a senior thesis.

Graduate Programs

Students planning to take graduate work in geology should have completed geology and supporting courses equivalent to those required for an undergraduate major in geology at The University of Iowa. Students with deficiencies may remedy them at the beginning of graduate study.

All beginning graduate students in geology must take 12:107 Geologic Orientation.

All graduate students in geology must perform teaching, research, or related appropriate services as part of the degree program.

Prospective graduate students in geology should consult "Rules and Regulations" in the "Graduate College" section of the *Catalog* for general admission and graduate study requirements.

Master of Science

The M.S. degree programs are designed to complete the student's broad, fundamental background in geology and the supporting sciences. They prepare the student for a professional career in geology or for more advanced and specialized studies—although in certain situations and with faculty approval, the student may pursue an already specialized program at the master's level.

Entering graduate students are assigned to a general graduate adviser. Before the end of the second semester, the student has selected a research area and related thesis topic. The department chair then approves a thesis adviser and two additional faculty members, who form the student's advisory committee. The student is responsible for getting the committee's approval for a suitable program of course work, and for satisfactory development of research plans as outlined in a thesis proposal that is submitted for departmental approval.

Master's degree candidates complete at least one-half of the Ph.D. language and tool requirements as part of the master's program. Course work taken to satisfy these requirements does not count toward the semester-hour requirements for the degree.

To qualify for admission to the final master's examination, the candidate must have at least a 3.00 grade-point average on graduate courses that he or she is taking toward the 30-semester-hour minimum requirement for the degree with at least 24 semester hours in residence at The University of Iowa. Additionally, the grade-point average on all graduate geology courses should be at least 3.00. Not more than 8 semester hours of thesis and research may be counted toward the 30-semester-hour minimum required for the degree program.

M.S. with Thesis

Students are encouraged to select thesis topics involving a variety of geological subdisciplines and scientific skills. Research topics might include field work or mapping, laboratory experiments, analytical work, or some combination.

M.S. without Thesis

The department encourages few students to pursue the M.S. without thesis. The program requires that applicants have approximately three months' experience working under supervision of a professional geologist, or equivalent experience in some phase of geologic activity.

Students should receive prior faculty permission to apply the experience toward the degree. They must submit a written report on the activity, describing the geologic principles it involved and its value and broader applications and implications. No college credit is granted.

The M.S. degree without thesis requires at least 38 semester hours of graduate course work, of which at least 8 semester hours must be earned in other departments of the University.

The faculty also may require that students submit a formal scientific report dealing with an appropriate subject or project. Credit may be granted for this report.

The final examination covers course work and work done in lieu of the thesis.

Master of Arts in Teaching (Earth Science)

This program enables students to combine certification to teach secondary school with participation in a specialized graduate curriculum. Awarded by the College of Education, the M.A.T. degree requires at least 20 semester hours of graduate study in professional education and at least 18 semester hours of graduate course work in earth science.

Doctor of Philosophy

The Ph.D. degree in geology requires at least 72 semester hours of graduate course work, including at least two full-time semesters in residence beyond the first 24 semester hours of graduate study.

Departmental language and tool requirements for the Ph.D. degree may be met either by achieving competence in two languages or in one language and one tool, or by achieving proficiency in one language. Competence is usually achieved by satisfactory completion of a one-year sequence of appropriate courses, proficiency by satisfactory completion of a two-year sequence.

French, German, and Russian meet departmental language requirements; statistics and computer science are suitable tool areas. In exceptional circumstances, the faculty may approve other languages or tool areas. Courses in related disciplines, such as botany, chemistry, physics, and biology, are not regarded as satisfying tool requirements, although they may provide indispensable background for geological specialization areas.

Course work taken to satisfy language and tool requirements may not be applied to credit requirements for the degree.

The following are the minimum requirements.

Satisfaction of course requirements for the M.S. degree in geology at The University of Iowa; where appropriate, additional work in one area may be approved as satisfying requirements in another.

An appropriate graduate course in another discipline; courses cross-listed between geology and other departments generally are not considered to meet this requirement.

At least 24 semester hours of graduate course work, exclusive of credits for dissertation research and beyond course work applied toward the M.S. degree.

The comprehensive examination covers, in depth, all subdivisions of one major field and one subdivision in each of three other major fields. It also presumes that the doctoral candidate is proficient in the basic elements of general geology, as presented by current elementary textbooks.

Major and Minor Fields

Economic Geology

Petroleum
Economic deposits
Mineral economics

Mineralogy

Crystallography
Determinative mineralogy
Crystal chemistry and mineral chemistry

Igneous and Metamorphic Petrology

Igneous petrology
Metamorphic petrology
Aqueous geochemistry and thermodynamics

Structural Geology

Geotectonics
Structural analysis
Remote sensing

Geophysics

Exploration geophysics
Solid-earth geophysics
Rock properties

Stratigraphy

Physical stratigraphy
Biostratigraphy
Depositional environments

Sedimentary Petrology

Sedimentation
Sandstone and carbonate petrology
Physical stratigraphy

Pleistocene Studies

Pleistocene geology
Vertebrate paleontology
Quaternary palynology

Paleontology

Paleobotany
Paleozoology
Biostratigraphy

General Geomorphology

Glacial and Pleistocene

Remote Sensing

Environmental Geology

Hydrogeology
Remote sensing
Engineering geology

Other Minor Subjects

Botany
Biology
Chemistry
Physics
Materials engineering
Geography
Hydraulics
Archaeology-anthropology
Science education
Others

Facilities

Resources and equipment available for research in the Department of Geology include mineralogy/petrology lab (X-ray diffractometers, powder cameras, wet chemistry lab, A.A. spectrophotometer, microscopes); sedimentology lab (thin-section lab, petrographic facilities, cathodoluminoscope); paleontology facility (invertebrate, vertebrate, palynological; including a major repository); photographic lab; geophysics (gravity meter, field and rock magnetometers, susceptibility meter, seismograph, high-pressure apparatus); Geological Survey Bureau (located in same building as the department, with subsurface core repository and remote sensing lab); network of microearthquake stations and seismographs; in-house terminal for the University's Weeg Computing Center (IBM 370, Prime 750's, HP2000 computers); trailer-mounted soil probe; scanning electron microscope; microprobe; geology library with 33,000 volumes/journals; and 70,000 maps.

Cooperative Activities

The department has collaborative work with the Geological Survey Bureau, and geology students sometimes work on projects for the survey.

The Departments of Geology, Geography, Anthropology, Chemistry, Botany, and Biology cooperate in sharing services, expertise, joint instruction, and equipment. The geology department is an important participant in the Iowa Quaternary Studies group, an interdisciplinary program that

promotes projects combining work in geology, geography, botany, biology, anthropology, and statistics. Course work, degree programs, and facilities are shared among departments.

Field Trips

Field trips are integral parts of several courses in geology, with frequent weekend general-interest events. In the Iowa City region, the geology is characterized by a layer of glacial drift on a largely Paleozoic sedimentary section a few hundred meters thick, overlying a Precambrian crystalline basement. Marine and terrestrial fossil assemblages, extensive reefs, and unique geode sites are located within a few hours' drive. Numerous Pleistocene glaciations are represented in Iowa, and field studies of landforms, exposures, and cores continue to yield information on sedimentology, stratigraphy, paleopedology, and fossil biotas from both glacial and interglacial deposits.

Spring break provides time for longer trips available to all geology students. In recent years, students have traveled to Death Valley, the Florida Keys, the southern Appalachians, the Big Bend region of Texas, and the Ozarks. Advanced classes visit Colorado, Ontario, Kansas, Oklahoma, and California.

Courses

Not all courses are offered every year.

Primarily for Undergraduates

12:000 Cooperative Internship in Geology **0 s.h.**
Practical experience in one or more phases of geology. Consent of instructor required. Prerequisites: grade of C or higher in 12:52 and 3.00 grade-point average in geology.

12:1 Lectures in Earth History and Resources **2 s.h.**
Ancient and modern environments on and within the earth, and processes by which they evolved; evolution of organisms; man's use and misuse of present environments. GER: natural sciences. Not open to students who have had 12:3, 12:5, or 12:6.

12:2 Lectures in Introduction to Environmental Geology **2 s.h.**
Continuation of 12:1. Not open to students who have had 12:4 or 12:5.

12:3 Principles of Physical Geology **2 s.h.**
Introductory course focusing on processes that have generated and currently are altering our physical environment; composition and inhomogeneity of the earth from atomic to planetary level, discussed in relation to man's resource requirements; processes of weathering, erosion, rock deformation, volcanism, mountain building, earthquakes, geomagnetism, and continental drift considered.

12:4 Evolution and the History of Life **4 s.h.**
Introductory survey of fossils over the past 3.5 billion years and the methods used to interpret their succession and evolutionary relationships. GER: natural sciences. Offered spring semesters. May not be taken with 12:6.

12:5 Introduction to Geology **4 s.h.**
Lectures and laboratories include rocks and minerals, surface processes (glaciers, rivers, etc.), and major earth processes (mountain building, plate tectonics); field trips. GER: natural sciences.

12:6 Evolution of the Earth **3-4 s.h.**
Lectures, laboratories, discussions, and field trips treating the observed and interpreted features of the earth in historical perspective; topics include origin of the earth; history and evolution of the earth's structure; dating of geological events; nature of the fossil record; an introduction to minerals, rocks, fossils; methods of geologic study. GER: natural sciences. Prerequisite: 12:5 or consent of instructor.

12:10 Honors Thesis in Geology **arr.**
Consent of the department required.

12:14 Lectures in Evolution and History of Life **2 s.h.**
Survey of fossils over the past 3.5 billion years; methods used to interpret succession and evolutionary relationships. Lecture companion to 12:4 Evolution and the History of Life. GER: natural sciences.

12:16 Field Trip **2 s.h.**
Seven to ten days during spring recess in areas of geologic interest: carbonate area of Florida; Rio Grande Rift (New Mexico), Death Valley (California and Nevada), Appalachian Mountains (Virginia). May be repeated. Consent of instructor required.

12:17 Geology of the U.S. National Parks **2 s.h.**
Illustrated discussion of the features responsible for setting aside our national parks, including basic geology, stratigraphy, landforms, geologic history, and important biological and archaeological features. Prerequisite: geology course or consent of instructor.

12:18 Geology Field Trip: Selected National Parks **2 s.h.**
Field trip to selected national parks and monuments to observe salient geological and geomorphological features; cost depends on park selected. Offered end of spring semester.

12:19 Directed Study **arr.**
May be repeated. Consent of instructor required.

12:23 Earth History and Resources **4 s.h.**
The relationship of igneous rocks, volcanoes, and mineral resources; absolute versus relative time; geologic evidence of evolution; mountain building; continental drift; river management, water rights, and landscapes in relation to expanding human populations. GER: natural sciences. Offered fall semesters. May not be combined with 12:5.

12:24 Introduction to Environmental Geology **3-4 s.h.**
Introduction to a wide range of environmental problems, including people's effect on climate, interaction of people and the landscape, water resources, population and food problems, energy resources and alternatives. GER: natural sciences.

12:25 Environmental Geology Problems **4 s.h.**
Continuation of 12:24, which is prerequisite; students predict dimensions of future problems and design mitigation or improvement; case histories include river management, mine reclamation, habitat preservation and improvement, coastal and agricultural erosion, energy conservation, and natural hazards; lectures, laboratories.

12:41 Mineralogy **4 s.h.**
Introductory study of minerals, stressing crystallography, chemical properties, phase relations, and identification. Offered fall semesters. Prerequisites: college earth science or geology; a math course through 22M:5 or equivalent, and introductory chemistry, or consent of instructor.

12:52 Elementary Petrology **4 s.h.**
Lecture and laboratory dealing with principles of petrology and hand specimen petrography for igneous, sedimentary, and metamorphic rocks. Prerequisites: 12:41; and 22M:25 or 22M:35, which may be taken concurrently.

12:92 Structural Geology **5 s.h.**
Introduction to rock deformation; description and classification of geologic structures; solution of structural problems; interpretation of geologic maps and aerial photographs. Prerequisites: 12:52, and 22M:35 or 22M:25.

12:93 Geologic Field Methods **2 s.h.**
Principles and techniques of basic geologic mapping. Held in the Black Hills, South Dakota, and Bighorn Mountains, Wyoming, in June, two weeks before 12:113. Prerequisite: 12:92.

For Undergraduates and Graduates

12:100 Geologic Training Assignment **1-3 s.h.**
Practical experience in one or more phases of geology. Consent of instructor required. Prerequisites: grade of C or higher in 12:52 and 3.00 grade-point average in geology.

12:102 Earth Surface Processes **3 s.h.**
Basic geomorphic and environmental processes that shape the earth's surface; emphasis on processes of weathering: mass movement—creep, landslides, and earth flow; erosion; transport; deposition by fluid agents—wind, water, and ice; methods used to study these physical processes. Prerequisite: 44:3 or 12:3 or 12:5 or consent of instructor. Same as 44:102.

12:103 Physical Geology **2-3 s.h.**
Introductory course focusing on processes that have generated and currently alter our physical environment; composition and inhomogeneity of the earth from atomic to planetary level, discussed relative to man's resource requirements; processes of weathering, erosion, rock deformation, volcanism, mountain building, earthquakes; geomagnetism and continental drift.

12:104 Historical Geology **2-3 s.h.**

12:106 The Way the Earth Works **3 s.h.**
The "new global geology" has become integrated into all facets of geology; topics in the context of plate tectonics (continental drift and seafloor spreading) include volcanoes, earthquakes, mountains, mineral resources, and diversity and extinction of species; telecourse. Recommended: college-level science course.

12:107 Geologic Orientation **1 s.h.**
Academic orientation, a review of degree requirements and programs, geological orientation, a field survey of local geology, and geotechnical skills, and introduction to the use of specialized facilities. Prerequisite: graduate standing or consent of instructor.

12:108 Introduction to Oceanography **2 s.h.**
Survey of descriptive, chemical, physical, biological, and geological aspects of the world ocean. Offered spring semesters. Recommended: familiarity with basic principles of chemistry, biology, physics, and earth science.

12:109 Geology of Iowa **3 s.h.**
Lecture, library, and field investigation of the sequence of events in geologic history responsible for the landscapes, substrates, and geologic resources of Iowa. Prerequisite: a course in geology or earth science.

12:110 Introduction to Remote Sensing **3 s.h.**
Remote sensing of the earth's surface and features from aircraft and satellites; aerial photograph interpretation; remote sensing systems, methods, and data analysis using the electromagnetic spectrum, including ultraviolet, visible, infrared, and microwave radiation; application of remote sensing to geologic and environmental problems; laboratory exercises. Prerequisite: college physics, physical geology, or equivalent.

12:113 Summer Field Course **6 s.h.**
Training in description and mapping of rock units and geologic structure in Wasatch and Uinta Mountains, Park City, Utah. Offered summer sessions. Prerequisites: 12:41, 12:52, 12:92, and 12:93.

12:116 Field Trip **2 s.h.**
Seven to ten days during spring break, in areas of geologic interest: carbonate area of Florida; Rio Grande Rift (New Mexico), Death Valley (California and Nevada), Appalachian Mountains (Virginia). May be repeated. Consent of instructor required.

12:117 Geology of the U.S. National Parks **2 s.h.**
Illustrated discussion of the features responsible for setting aside our national parks, including basic geology, stratigraphy, landforms, geologic history, and important biological and archaeological features. Prerequisite: a geology course or consent of instructor.

12:118 Geology Field Trip to Selected U.S. National Parks **2 s.h.**

12:119 Directed Study **arr.**
May be repeated. Consent of the department required.

12:121 Principles of Paleontology **3 s.h.**
Nature, origin, and use of fossils; taxonomic principles, species concepts, zoological nomenclature; evolution of selected animal groups; field and laboratory study of taxa of greater geologic significance.

12:122 Evolution of the Vertebrates **2 s.h.**
Lectures on major features of vertebrate evolution as recorded in the geologic record; taxonomic, stratigraphic, and paleoecological concepts of selected taxa. Prerequisites: introductory geology or zoology, and junior standing.

12:123 Vertebrate Osteology **2 s.h.**
Laboratory designed to familiarize students with basic skeletal structure of vertebrates; emphasis on mammals and identifying and interpreting remains from

paleontological and archaeological sites. Prerequisites: introductory geology or zoology, and junior standing.

12:124 Invertebrate Paleontology **4 s.h.**
Lecture, laboratory, and field review of morphology, taxonomy, evolution, and ecology of all significant macroscopic invertebrates. Prerequisite: college zoology or consent of instructor.

12:125 Approaches to Paleogeography **2 s.h.**
Theory and techniques for paleogeographic analysis, including regional and global applications; emphasis on need to integrate various lines of geographic evidence (paleomagnetic data, paleoclimatic interpretations, biogeographic patterns) within plate tectonic and regional stratigraphic framework.

12:127 Paleobotany **4 s.h.**
Phylogenetic study of plants using fossil evidence; paleobotanical techniques, economic applications in coal and petroleum industries; lectures, laboratory, field trips. Prerequisite: introductory botany or geology. Same as 2:120.

12:128 Quaternary Palynology and Paleobotany **5 s.h.**
Lectures and laboratories in pollen morphology, production, dispersal, preservation, and use in biogeography, paleoecology, paleoclimatology, and archaeology. Prerequisite: college-level geology or botany. Same as 2:121.

12:132 Sedimentology **3 s.h.**
Lectures and laboratory; frequent field trips to examine the physical, chemical, and biochemical processes that generate sediments and sedimentary rocks; weathering, transportation, depositional, and diagenetic processes. Prerequisites: physical and historical geology (e.g., 12:1 and 12:2; 12:3 and 12:4; or 12:5 and 12:6) and one year of college chemistry.

12:133 Carbonate Petrology **4 s.h.**
Lectures and laboratory; identification and interpretation of constituents, structures, environments of formation, and patterns and processes of diagenesis of carbonate rocks. Offered fall semesters. Prerequisite: familiarity with optical microscope and basic principles of sedimentation.

12:134 Sandstone Petrology **3 s.h.**
Lectures and laboratory; syngenetic and diagenetic characteristics of sandstones occurring in a variety of tectonic and depositional settings. Offered spring semesters of odd years. Prerequisites: petrology, optical mineralogy, and stratigraphy or sedimentology.

12:135 Depositional Environments **2-3 s.h.**
Survey of modern patterns of sedimentation; emphasis on interpreting depositional environments of ancient sedimentary rocks and deciphering resulting stratigraphic patterns. Offered spring semesters. Prerequisites: 12:121, 12:132, and 12:161; or consent of instructor.

12:141 Optical Mineralogy/Petrography **4 s.h.**
Theory and practice of mineral study with the polarizing microscope; introduction to the study of igneous, sedimentary, and metamorphic rocks in thin section. Offered fall semesters. Prerequisites: 4:7 or 4:13; 22M:19; 29:12 or 29:18; and 12:52.

12:143 X-ray Crystallography **3 s.h.**
Study of crystal structure, properties, and uses of clay minerals; study of space group symmetry; theory and practice of X-ray powder methods emphasizing application to minerals. Prerequisites: college physics and mineralogy.

12:149 Elements of Geochemistry **3 s.h.**
Application of elementary chemical principles to geologic problems. Prerequisites: 4:7; 4:8 or 4:13; 4:14; and 12:52.

12:153 Geocomputing **3 s.h.**
Survey of computer applications in geology; topics include text editing, data management, interactive modeling, computer graphics. Open only to geology majors and graduate students. Recommended: 22C:7.

12:154 Advanced Geocomputing **2 s.h.**
Design of programs with applications in geology; special emphasis on interactive modeling and graphics. Open only to geology majors and graduate students. Prerequisite: FORTRAN or Pascal or consent of instructor.

12:155 Geostatistics **2 s.h.**
Statistical methods useful in the earth sciences: t-tests, chi-squared tests, analysis of variance, regression analysis, discriminant analysis, factor analysis, cluster analysis, use of statistical computer packages; seminar. Offered spring semesters. Recommended: one semester of statistics. Same as 22S:105.

12:156 Scanning Electron Microscopy and X-ray Microanalysis **3 s.h.**
The theory, operation, and application of scanning electron microscopy and X-ray microanalysis for advanced students, staff, and investigators. Same as 2:156, 52:156.

12:161 Principles of Stratigraphy **3 s.h.**
Genesis of sedimentary rocks, geologic time, stratigraphic nomenclature, correlation, tectonic and eustatic influences, and stratigraphic field methods. Prerequisite: 12:52 or consent of instructor.

12:165 Transmission Electron Microscopy and X-ray Microanalysis **3 s.h.**
Theory, operation, and applications of TEM, STEM, and thin film X-ray microanalysis techniques for materials science majors; practice in a wide variety of specimen preparation techniques including metals, glass, ceramics, and minerals. Consent of instructor required. Same as 52:157.

12:166 Hydrogeology and Groundwater Quality **3 s.h.**
Quantity and quality of groundwater flow; wells, pumping tests, flow nets, water chemistry, aquifer contamination, mathematical modeling; includes scheduled lab and field experiments. Prerequisite: senior or graduate standing. Same as 53:103.

12:172 Glacial and Pleistocene Geology **3 s.h.**
Lectures emphasize processes by which glacial and periglacial materials and landscapes evolve; laboratory exercises introduce specific regional examples. Prerequisite: an introduction to physical geology or physical geography.

12:173 Quaternary Environments **3 s.h.**
Interdisciplinary seminar on archaeological, botanical, zoological, physical, and chemical means of reconstructing ice-age environments; techniques and results; emphasis on speaking and writing. Consent of instructor required.

12:175 Paleoecology of Quaternary Mammals **3 s.h.**
Identification, biogeography, and paleoecology of Pleistocene and Holocene small mammals. Prerequisite: 12:122 or consent of instructor.

12:177 Geologic Illustration **1 s.h.**
Instruction and practice in illustrating outcrops, landscapes, specimens, and geoengineering structures by means of block diagrams, fence diagrams, shaded relief, cutaways, schematic perspectives, and precision 3-D scalars. Recommended: concurrent enrollment in 12:179.

12:179 Engineering Geology **3 s.h.**
Application of geologic principles to engineering practice for geologists, civil engineers, and environmentalists; most topics have environmental themes—septic systems, dam failure, avalanches, erosion control, tunneling, strip-mine reclamation, landfills, floods, and coastal management. Prerequisite: junior or higher standing in geology, civil engineering, or physical geography.

12:180 Solid-Earth Geophysics **3 s.h.**
General geophysics: Earth's interior, composition, structure, dynamic character, and physical properties; earthquakes and seismology, gravity and magnetic fields, heat flow, radioactivity and age dating, probing the deep interior. Prerequisites: college geology and an introductory course in physics, or consent of instructor.

12:181 Exploration Geophysics **3 s.h.**
Techniques used in geophysical exploration for oil and gas, minerals, groundwater, and subsurface structure; gravity, magnetic, seismic, electrical methods; well logging; lab exercises and use of field equipment. Prerequisite: 12:180; or college geology, physics, and mathematics; or consent of instructor.

12:182 Principles of Economic Geology **3 s.h.**
Principles of formation, distribution, and economic utilization of metallic and nonmetallic mineral processes of formation deposits; field trip required. Prerequisite: 12:52. Recommended: 12:141.

12:186 Petroleum Geology **3 s.h.**
Geologic processes that affect petroleum generation, migration, trapping, and accumulation; survey of geological, geochemical, and geophysical exploration techniques; discussion of economic and political factors that influence petroleum exploration and production. Offered spring semesters of even years. Prerequisite: 12:161 or 12:92 or consent of instructor.

12:191 Geotectonics **3 s.h.**
Origin of continents, oceans, and orogenic belts; based on geophysical, geochemical, and geologic evidence. Prerequisite: 12:180. Recommended: one year of calculus.

Primarily for Graduates

12:222 Micropaleontology **4 s.h.**
Morphology, taxonomy, and evolution of selected groups of microfossils. Prerequisites: 12:121 or 12:161; and college zoology; or consent of instructor.

12:223 Seminar: Paleontology **3 s.h.**
May be repeated. Consent of instructor required. Prerequisite: 12:222.

12:225 Paleoecology Seminar **2 s.h.**
Fossil communities and factors responsible for their structure. May be repeated. Prerequisites: 12:121 and college zoology, or consent of instructor.

12:227 Systematics Seminar **3 s.h.**
Readings, discussions, and practical exercises on the principles of systematics, with special emphasis on phylogeny reconstruction and the recognition and interpretation of evolutionary patterns in the fossil record. May be repeated. Prerequisites: 12:121 and college zoology, or consent of instructor.

12:228 Advanced Earth Surface Processes **3 s.h.**
Theoretical concepts and empirical studies of hydrologic, climatic, and geomorphic processes as related to the earth's surface: measurement, analysis, modeling of such processes; drainage basin analysis and modeling; responses to climatic and environmental change. Open only to graduate students in physical geography or geology or to others by consent of instructor. Same as 44:228.

12:234 Seminar in Current Topics in Sedimentary Petrology **1-2 s.h.**
Weekly discussions based on assigned readings and/or laboratory materials addressing current areas of research in sedimentary petrology; topics are chosen and researched by the class and may include detrital, chemical, and/or biochemical sediments. Prerequisite: carbonate or sandstone petrology or consent of instructor.

12:235 Seminar in Depositional Environments **1-2 s.h.**
Advanced topics in interpretation of depositional environments of sedimentary rock units. Offered fall semesters. Prerequisite: 12:135.

12:243 Groundwater Geochemistry **3 s.h.**

12:244 Sedimentary Geochemistry **3 s.h.**

12:248 Volcanism **2 s.h.**
Current topics in physical volcanology, volcanic geochemistry, and volcano-tectonic associations.

12:251 Igneous Petrology **3 s.h.**
Fundamentals of phase equilibria, isotope and trace element geochemistry, geochemical modeling; generation and differentiation of magmas in context of plate tectonic theory. Prerequisites: 12:52 and 12:141, or consent of instructor.

12:252 Isotope Geochemistry **3 s.h.**
Radiogenic and stable isotope systematics, applications to geological and environmental problems. Prerequisite: 12:149 or consent of instructor.

12:254 Geochemical Thermodynamics and Kinetics **3 s.h.**
Fundamental principles of chemical thermodynamics and kinetics applicable to both high-temperature and low-temperature geological systems; equilibrium and irreversible thermodynamics, the phase rule, chemography, solid solutions, chemical potential diagrams, ionic activities in mixed aqueous electrolytes, silicate melts, retrieval of thermodynamic data, evaluation of thermodynamic databases, nucleation, reaction rates, and calculation of thermodynamic and kinetic properties of mineral melts and fluids in natural geologic systems; for geology students. Prerequisite: 12:149 or consent of instructor.

12:255 Metamorphic Petrology **3 s.h.**
Lecture, seminar, and laboratory; genesis of metamorphic rocks from fundamentals of thermodynamics, experimental information, and geologic observations. Prerequisites: 12:52 and 12:141, or consent of instructor.

12:256 Seminar in Electron Microscopy in Materials Science **3 s.h.**
Covers practical and theoretical aspects of high-resolution SEM, BSEM, STEM; advanced electron beam-specimen interaction and Monte Carlo simulation techniques; X-ray elemental mapping and image analysis; and signal processing techniques. Same as 52:256, 53:256.

12:257 Metamorphic Petrology Seminar 1-2 s.h.
Discussion of current topics in metamorphic petrology.

12:261 Regional Stratigraphy 3 s.h.
Seminar covering contemporary stratigraphic concepts in light of new developments in global tectonics, and detailed stratigraphic analyses of class-selected sedimentary basins and areas. Prerequisite: 12:161.

12:262 Mesozoic Stratigraphy and Sedimentation 2 s.h.
Analyses of selected Mesozoic basins and seaways around the world, with emphasis on depositional styles and stratigraphic problems. Prerequisite: 12:161.

12:263 Biostratigraphy 3 s.h.
Principles and methods of biostratigraphic correlation, with emphasis on evaluation of current techniques. Prerequisites: 12:161 and 12:222, or equivalent.

12:271 Advanced X-ray Microanalysis 3 s.h.
Same as 52:271.

12:272 Advanced Scanning Electron Microscopy 3 s.h.
Theoretical and practical aspects of high-resolution scanning electron microscopy, advanced electron beam specimen interaction, image analysis and signal processing techniques in a wide variety of applications using state-of-the-art equipment. Consent of instructor required. Prerequisite: 12:156. Same as 52:272.

12:273 Seminar in X-ray Microanalysis in Materials Sciences 3 s.h.
New techniques, developments, and practical and theoretical aspects of EDS, WDS, and EELS; applications of ZAF, APP LSQ, FOIL, and HALL programs on bulk materials, thin films, and powders. Consent of instructor required. Prerequisite: 12:156 or 12:165. Same as 52:257.

12:280 Seminar Geophysics 1-2 s.h.
Discussion and investigation of geophysics topics such as high-pressure geophysics, exploration geophysics, physical properties of rocks, computer processing of data, and remote sensing.

12:281 Gravity and Magnetic Exploration 3 s.h.
Basis, techniques, and use of the gravity and magnetic methods of geophysical prospecting; associated practical exercises, lab work, computer use, and field surveys. Prerequisite: 12:181.

12:282 Seismic Exploration 3 s.h.
Basis, techniques, and applications of the seismic method of geophysical prospecting; data acquisition, analysis and processing, and interpretation; laboratory includes practical exercises and computer use. Prerequisite: 12:181.

12:286 Subsurface Geology 3 s.h.
Survey of techniques used to solve subsurface geological problems, including lithologic sample analysis, well-log analysis, and seismic stratigraphy; applicability of techniques demonstrated with case studies and problem-solving exercises. Offered fall semesters of odd years. Prerequisites: 12:186 and 12:161, or consent of instructor.

12:288 Rock Magnetism and Paleomagnetism 2 s.h.
Geomagnetism and its applications; earth's magnetic field, remanent magnetization, magnetic properties of minerals and rocks, paleomagnetism, experimental procedures; uses in continental drift, stratigraphic correlation, structural geology. Prerequisite: college geology or materials science. Recommended: 12:180.

12:293 Advanced Structural Geology 4 s.h.
Mechanics of behavior of rock materials and physical processes in geology. Prerequisite: one year of calculus.

12:296 Seminar: Structural Geology 1-2 s.h.
Consent of instructor required.

12:300 Research: Summer Field and Laboratory arr.
May be repeated.

12:301 Research: General Geology arr.
May be repeated.

12:315 Research: Ground Water arr.
May be repeated.

12:320 Research: Paleontology arr.
May be repeated.

12:321 Research: Micropaleontology arr.
May be repeated.

12:330 Research: Sedimentology and Sedimentary Petrology arr.
May be repeated.

12:340 Research: Mineralogy arr.
May be repeated.

12:350 Research: Petrology arr.
May be repeated.

12:360 Research: Stratigraphy arr.
May be repeated.

12:370 Research: Geomorphology and Pleistocene Geology arr.
May be repeated.

12:380 Research: Economic Geology arr.
May be repeated.

12:385 Research: Geophysics arr.
May be repeated.

12:390 Research: Structural Geology arr.
May be repeated.

12:395 Research in Geologic Remote Sensing arr.
May be repeated.

GERMAN

Chair: Wolfgang Ertl
Professors: Judith P. Aikin, Edward Dvoretzky, Wolfgang Ertl, James P. Sandrock, Ingeborg H. Solbrig, John A.A. ter Haar
Associate professors: Ford B. Parkes-Perret, James P. Pusack, Richard M. Runge
Associate professor emeritus: Milton Zagel
Assistant professors: Sabine I. Gölz, Waltraud Maierhofer, Erwin P. Tschirner
Undergraduate degree offered: B.A. in German
Graduate degrees offered: M.A., Ph.D. in German

The primary function of the Department of German is to transmit to interested American liberal arts students a knowledge of the language, literature, and culture traditionally designated as German, as expressed in the language and cultural heritage of West and East Germany, Austria, and Switzerland.

University graduates with degrees in German frequently enter the teaching profession. They also find positions in government, foreign service, and commercial enterprise.

Undergraduate Program

Students majoring in German choose one of two major tracks: the humanities track or the applied German track.

The humanities track enables students to concentrate on German language, literature, and culture, both past and present. It is recommended for students who want to explore the German world of ideas and their influence through the ages. Students who plan to pursue graduate study in German must take the humanities track, as must those who plan to complete the undergraduate teaching major in German in conjunction with the College of Education (see the "College of Education" section of the *Catalog*).

The applied German track is designed to give students practical skills and proficiency in the language for use in business and government. It is especially useful when combined with a business-oriented curriculum. The College of Liberal Arts and the College of Business Administration offer a joint program leading to an International Business Certificate. For details, see the "College of Business Administration" section of the *Catalog*.

Each track usually requires 30 semester hours of course work beyond the basic program. (Students who first enrolled at The University of Iowa before June 1988 are held to a 24-semester-hour requirement.)

The following course sequences, or their equivalents, are required for students who begin a major in German with no previous experience in the German language.

Basic Program

13:11 Elementary German I	4 s.h.
13:12 Elementary German II	4 s.h.
13:21 Intermediate German I	3 s.h.
13:22 Intermediate German II	3 s.h.

The basic program also may be satisfied by various combinations of courses from the following: 13:13, 13:14, 13:25, 13:26, and 13:27. See the German department undergraduate adviser for details.

Humanities Track

Third Year

13:101 Introduction to Modern German Literature I	3 s.h.
13:102 Introduction to Modern German Literature II	3 s.h.
13:103 Composition and Conversation I	3 s.h.
13:104 Composition and Conversation II	3 s.h.

Fourth Year

13:105 German Cultural History	3 s.h.
13:111 Survey of German Literature	3 s.h.
13:112 Survey of German Literature	3 s.h.
13:116 Advanced Composition and Conversation	3 s.h.
13:198 Undergraduate Special Topics	3 s.h.

An elective from the courses offered within the department, or a course related to Germanic studies offered in another department (approval of major adviser required). 3 s.h.

Applied German Track

Third and Fourth Years

*13:103 Composition and Conversation I	3 s.h.
*13:104 Composition and Conversation II	3 s.h.
13:106 Principles and Techniques of Translation	3 s.h.
13:108 The German Media	3 s.h.
13:114 Business German	3 s.h.
13:115 Contemporary German Civilization	3 s.h.
13:116 Advanced Composition and Conversation	3 s.h.
13:198 Undergraduate Special Topics	3 s.h.
One German department course in literature or culture	3 s.h.

An elective from the courses offered within the department, or a course related to

Germanic studies offered in another department (approval of major adviser required). 3 s.h.

*May be taken in either order.

German majors, both graduate and undergraduate, are urged to supplement their degree programs with relevant courses in areas such as German history, philosophy, and business.

Minor

A minor in German requires 15 semester hours of course work in college-level German with a minimum grade-point average of 2.00. Twelve of these semester hours must be in advanced courses (13:100 and above) at The University of Iowa. All courses numbered 100 and above count toward the minor except 13:118, 13:123, 13:154, 13:173, 13:182, and 13:183.

Certification for Teaching Minor

In addition to the basic program requirements for the first and second year, students must take the following courses or their equivalents for certification of the teaching minor in German.

13:101 Introduction to Modern German Literature I	3 s.h.
13:102 Introduction to Modern German Literature II	3 s.h.
13:103 Composition and Conversation I	3 s.h.
13:104 Composition and Conversation II	3 s.h.
13:116 Advanced Composition and Conversation	3 s.h.

Honors

Honors in German is open to exceptional students who are in the College of Liberal Arts Honors Program and have completed three years of college-level German, or the equivalent, with a grade-point average of at least 3.50 in upper-division German courses.

Participating students register for the following courses.

13:190 Honors Program in German	3 s.h.
13:191 Honors Research and Thesis	3 s.h.

Honors students are expected to engage in readings and discussions in German literature and culture and to write essays in German and English. Students meet with their faculty director of studies on a regular basis.

The program concludes with presentation of an honors thesis to a faculty committee of at least three members.

Graduate Programs

Master of Arts with Thesis

Graduate students who show potential for productive scholarship and who plan to pursue doctoral study in German should elect the master's degree program with thesis. The thesis program requires a minimum of 30 semester hours, or equivalent, of graduate-level work and fulfillment of other requirements of the Department of German and the Graduate College (see the "Graduate College" section of the *Catalog*).

Students who have not completed major courses or their equivalents in the department's undergraduate program must take those courses along with the courses required for the M.A. degree. Some candidates may qualify for graduate credit for such work.

With the graduate adviser's approval, students may take some of the required 30 semester hours outside the department in related subjects, such as, philosophy, history, linguistics, or other languages.

Usually students may receive two semester hours of credit for satisfactory completion of the thesis. The thesis topic may be either linguistic or literary and is subject to approval by the faculty.

Master of Arts without Thesis

Graduate students preparing for careers in secondary school teaching, government service, or translation work may elect the master's degree program without thesis. This program requires a minimum of 38 semester hours of course work and is considered a terminal degree.

The same course requirements outlined for the M.A. with thesis apply to candidates for the M.A. without thesis. Students in the latter program should, with the approval of the graduate adviser, select courses that will best prepare them for their chosen careers.

Doctor of Philosophy

The Ph.D. degree is awarded upon the satisfactory completion of a minimum of 72 semester hours of graduate credit and fulfillment of other requirements of the Department of German and the Graduate College (see the "Graduate College" section of the *Catalog*), with a concentration in either Germanic linguistics or German literature.

Credit received toward the M.A. degree usually is applied to the Ph.D. Students may earn up to 12 additional semester hours of credit for satisfactory completion of the Ph.D. dissertation.

Graduate courses in related subjects outside the department may be counted toward the degree with the approval of the graduate adviser.

Graduate Degree Language Tools

Master of Arts

Before they can take the M.A. exam, candidates must demonstrate a reading knowledge of a foreign language other than German, at a level equivalent to two years of college study or four years of high school study.

Competence may be demonstrated either by submitting proof of having taken the required course work with a grade-point average of 3.00 or higher, or by passing an exam at the fourth-semester college level as determined by the appropriate language department.

Doctor of Philosophy

A candidate concentrating in literature must demonstrate a reading knowledge of French and of another language determined by the adviser to be pertinent to the candidate's research interests.

Doctoral candidates in Germanic linguistics must demonstrate a reading knowledge of French or Russian and of a modern Scandinavian language or Dutch.

Competence in any of these languages may be demonstrated by the methods described under "Master of Arts."

Financial Aid

Teaching assistantships, research assistantships, teaching-research fellowships, and tuition scholarships are available for qualified graduate students. The department awards the Wilson and the Funke prizes to students of distinction.

Special Facilities

Students have the opportunity to improve their comprehension and command of German by working with recorded materials in the Language Media Center. They also may benefit from the computer-assisted instruction program.

An extensive collection of works and periodicals in the University Libraries facilitates research in all major areas of German literature and Germanic linguistics at all levels of study.

The Foreign Language House is available to undergraduate and graduate students as an on-campus housing option.

Foreign Study

The Department of German participates in the Regents Summer Program in Austria. Sponsored by the three Iowa Regents universities, this program is open to students in all disciplines.

A three-week session is conducted at St. Radegund, near Graz, Austria. Instruction in both language and culture is provided on appropriate levels. A second four-week

session is held in Vienna, where faculty of the International University at the University of Vienna conduct morning classes daily, again on several levels. An independent travel period is scheduled during the program.

To participate, students must be admitted to one of the three Iowa Regents universities for the summer session. Applicants should have a good basic knowledge of German—usually two years of college-level German or the equivalent. Students with less than two years may be accepted with the approval of the campus coordinator.

Graduate students are eligible to apply. All students are expected to speak only German while participating in the program. Program grants are available for qualified applicants.

For more information, write to the Department of German.

Courses

Primarily for Undergraduates

13:000 Cooperative Education Internship **0 s.h.**

13D:11 First-Semester Dutch **4 s.h.**
Use of grammar-reading method to teach students how to read Dutch with understanding; introduction to pronunciation and elementary speech patterns. GER: foreign language.

13D:12 Second-Semester Dutch **4 s.h.**
Continuation of grammar-reading approach, with expanded reading of simple texts in Dutch; continued study of pronunciation and speech patterns. GER: foreign language. Prerequisite: 13D:11 or equivalent.

13D:21 Third-Semester Dutch **3 s.h.**
Skills development through grammar review and advanced readings in Dutch literature, culture, news media, other sources; introduction to composition, conversation, oral comprehension. GER: foreign language. Prerequisite: 13D:12 or equivalent.

13D:22 Fourth-Semester Dutch **3 s.h.**
Devoted to accurate and fluent reading at optimum level of understanding; focus on introduction of literary concepts, discussion of texts; continued emphasis on composition and conversation. GER: foreign language. Prerequisite: 13D:21 or equivalent.

13D:100 Individual Dutch **arr.**
Arranged with instructor.

13:1 German and Germany for Travelers I **2 s.h.**
Does not satisfy language requirement.

13:11 Elementary German I **3-4 s.h.**
Introduction to German language and culture through development of listening, reading, speaking, and writing skills; computer, language laboratory work. GER: foreign language.

13:12 Elementary German II **3-4 s.h.**
Continuation of 13:11. GER: foreign language. Prerequisite: 13:11 or equivalent.

13:13 Intensive Elementary German **6 s.h.**
Standard first- and second-semester courses combined; language laboratory. GER: foreign language. Open only to undergraduates.

13:14 First-Year German Review **4 s.h.**
Accelerated course for students who have had some previous experience with German; preparation for third-semester German. GER: foreign language. Consent of instructor required. Prerequisite: previous experience with German.

13:17 German Heroic and Erotic Literature of the Middle Ages **3 s.h.**
Masterpieces, including *Parzifal*, the *Nibelungenlied*, and *Tristan*, read in English translation. GER: foreign civilization and culture, humanities.

13:21 Intermediate German I **3 s.h.**
Further development of the skills of listening, reading, speaking, and writing; systematic review and expansion of basic grammar; intensive vocabulary building. GER: foreign language. Prerequisite: 13:12 or equivalent.

13:22 Intermediate German II **3 s.h.**
Continuation of 13:21. GER: foreign language. Prerequisite: 13:21 or equivalent.

13:25 Intensive Intermediate German **6 s.h.**
Standard third- and fourth-semester courses combined; emphasis on speaking and reading; language laboratory. GER: foreign language. Open only to undergraduates.

13:26 Accelerated German Reading I **6 s.h.**
First of a two-course sequence for students who want a thorough foundation in German grammar and vocabulary and an intensive approach to reading German; extensive out-of-class assignments. GER: foreign language. Open only to undergraduates.

13:27 Accelerated German Reading II **6 s.h.**
Continuation of 13:26; vocabulary building and extensive reading of sophisticated texts; extensive out-of-class assignments. GER: foreign language. Open only to undergraduates. Prerequisite: 13:26 or equivalent.

For Undergraduates and Graduates

13:100 Individual German **arr.**
For majors and minors in German.

13:101 Introduction to Modern German Literature I **3 s.h.**
Reading and discussion of representative German authors whose works influence modern times. GER: foreign civilization and culture, humanities. Prerequisite: 13:22 or equivalent.

13:102 Introduction to Modern German Literature II **3 s.h.**
Continuation of 13:101. GER: foreign civilization and culture, humanities. Prerequisite: 13:101 or equivalent.

13:103 Composition and Conversation I **3 s.h.**
For students who want to improve their active command of the German language in reading, speaking, and writing. 13:103 and 13:104 may be taken in either order, but not concurrently. Prerequisite: 13:22 or equivalent.

13:104 Composition and Conversation II **3 s.h.**
See 13:103. Prerequisite: 13:22 or equivalent.

13:105 German Cultural History **3 s.h.**
Emphasis on development of arts, philosophy, and literature. GER: foreign civilization and culture.

13:106 Principles and Techniques of Translation **3 s.h.**
Introduction to theory of translation; study and practice of methods and techniques for translating technical, scientific, journalistic, and literary texts; emphasis on German-to-English translation. Offered spring semesters of even years. Prerequisite: at least one third-year, college-level German course or equivalent.

13:108 The German Media **3 s.h.**
Acquisition of reading and listening skills: comprehension, reading speed, passive vocabulary building, scanning and skimming, and parsing complex constructions using accounts of events of current interest in various media, such as newspapers, magazines, and television. Offered fall semesters of odd years. Prerequisite: 13:22 or equivalent.

13:109 Regents Program Abroad in Austria **arr.**
See description under "Foreign Study" in this section of the *Catalog*.

13:111 Survey of German Literature **3 s.h.**
Development from earliest times to 1775. Prerequisite: 13:102 or equivalent.

13:112 Survey of German Literature **3 s.h.**
1775 to present. Prerequisite: 13:102 or equivalent.

13:114 Business German **3 s.h.**
Introduction to the world of German business and the role of German-speaking countries in world trade; emphasis and practical work in German business protocol and business correspondence. Offered fall semesters of even years. Prerequisite: two years of college-level German or equivalent.

13:115 Contemporary German Civilization **3 s.h.**
Government and political structure, economy, mass media, education, various aspects of social and cultural life of West and East Germany, Austria, and Switzerland from the end of World War II to the present. GER: foreign civilization and culture. Offered spring semesters of odd years. Prerequisite: at least one third-year, college-level German course or equivalent.

13:116 Advanced Composition and Conversation **3 s.h.**
Oral and written exercises; for undergraduate German majors and minors. May be repeated. Prerequisites: 13:103 and 13:104, or equivalent.

13:118 The Third Reich and Literature **3 s.h.**
Nazi literature, literature of the Holocaust and the Opposition, and exile literature; in English translation. GER: foreign civilization and culture, humanities.

13:119 German Folklore and Literature **3 s.h.**
Genres such as *Volkslied*, *Volkslegende*, and *Volksmärchen*; development of these forms and other folk elements in German literature; structured around the theme of "das Volk" in German literature. Consent of instructor required. Prerequisite: 13:22 or equivalent.

13:120 Methods: Foreign Language **3 s.h.**
Same as 7S:116, 9:150, 20:119, 35:115.

13:121 Methods of German Language Teaching **2 s.h.**
Orientation and training in techniques of elementary and intermediate language teaching; readings on theoretical and practical topics as a basis for class discussion; scheduled observation of foreign-language teachers in the classroom.

13:123 Topics in Foreign Language Instructional Technology **2 s.h.**
Concepts for the development of technology-based materials for foreign language instruction; topics may include computer authoring languages, interactive media, language laboratory methods and management. Same as 9:158, 35:117.

13:130 Internship Abroad **arr.**
Credit work experience related to student's major field of study; positions must require significant use of German language in a German-speaking country and must be arranged by the student in collaboration with the Office of Cooperative Education; written reports required. Corequisite: 13:000.

13:139 Contemporary German Literature **3 s.h.**
Contemporary literary life in the German-speaking countries as it manifests itself in the various genres; short stories, novels, dramas or radio plays, and lyric poetry. Senior standing in German course work required.

13:154 Human Nature and the Impact of Science **2-4 s.h.**
Interdisciplinary; the relationship of science to humanistic, social, and religious thought; requires no knowledge of German. GER: humanities. Same as 33:154.

13:183 The Faust Tradition in Western Civilization **3 s.h.**
Development of the Faust theme in world literature, beginning with antiquity; the historical Faust, the *Faust Book*, Marlowe's *Dr. Faustus*, critical analysis of Goethe's *Faust I*, last act of *Faust II*, and modern Faust criticism; requires no knowledge of German. GER: humanities.

13:190 Honors Program in German **3 s.h.**
Individual readings and discussions in German literature and culture; essay writing in German and English; regular meetings with faculty director of studies. Prerequisites: three years of college-level German or equivalent, and a 3.50 grade-point average in German courses.

13:191 Honors Research and Thesis **3 s.h.**
Preparation of honors thesis and presentation to a faculty committee of at least three members. Open only to honors students. Consent of instructor required. Prerequisite: 13:190.

13:198 Undergraduate Special Topics **3 s.h.**
Open only to advanced undergraduates. May be repeated. Consent of instructor required.

Language Courses for Graduate Nonmajors

13:113 Intensive Elementary German 4 s.h.
See 13:13. Open only to graduate students.

13:125 Intensive Intermediate German 4 s.h.
See 13:25. Open only to graduate students.

13:126 Accelerated German Reading I 4 s.h.
See 13:26. Open only to graduate students.

13:127 Accelerated German Reading II 4 s.h.
See 13:27. Open only to graduate students. Prerequisite: 13:126 or equivalent.

For Graduates

13:200 Advanced Studies arr.
Special problems of German literature and linguistics. Open only to graduate majors in German.

13:220 The German Novel 3 s.h.
May be repeated.

13:223 German Poetry 3 s.h.
May be repeated.

13:224 The German Drama 3 s.h.
May be repeated.

13:227 German Novelle 3 s.h.

13:241 History of the German Language 3 s.h.
Same as 103:231.

13:243 Middle High German 3 s.h.
For students concentrating in linguistics. Same as 103:252.

13:244 Middle High German Literature 3 s.h.
For students concentrating in literature.

13:249 History of the Scandinavian Languages 3 s.h.
Linguistic texts in Danish, Swedish, and Norwegian; extensive readings. Same as 103:232.

13:251 Early German Literature 3 s.h.
German literature from earliest documents to Middle High German period.

13:261 German Literature of the Renaissance and Reformation 3 s.h.

13:271 German Literature of the Baroque 3 s.h.

13:281 The Age of Enlightenment and the Early Period of Storm and Stress 3 s.h.

13:283 The Age of Goethe 3 s.h.
Storm and Stress (Goethe, Schiller, Klinger, Lenz) and the Weimar classicism (1794-1805) of Goethe and Schiller; the interdependence of the movements and their theoretical basis (Herder, Winckelmann) vis-a-vis representative works of the period.

13:285 Goethe 3 s.h.

13:291 German Romanticism 3 s.h.

13:294 German Realism 3 s.h.

13:295 German Literature from Naturalism to Expressionism 3 s.h.

13:298 Special Topics in German Literature arr.
Open only to graduate majors in German. May be repeated.

13:300 Master's Thesis arr.

13:350 Pre-Comprehensive Registration 0 s.h.

13:371 Seminar in Early German Literature 3 s.h.
May be repeated.

13:381 Seminar in German Literature of the Eighteenth Century 3 s.h.
May be repeated.

13:391 Seminar in German Literature of the Nineteenth Century 3 s.h.
May be repeated.

13:396 Seminar in German Literature of the Twentieth Century 3 s.h.
May be repeated.

13:398 German Poetry of the Twentieth Century 3 s.h.

13:399 Theory of Literature 3 s.h.

13:400 Ph.D. Dissertation arr.

GLOBAL STUDIES

Chair: James McCue (Religion)
Committee members: Eleanor Anstey (Social Work), Stephen Arum (Office of International Education and Services), Mitchell Ash (History), Rex Honey (Geography), William Klink (Physics and Astronomy), Mac Marshall (Anthropology), Gerald Nordquist (Economics), Dee Norton (Psychology), Becky Roberts (Geography), Abdi Samatar (Geography), Lois Sayrs (Political Science),

The Global Studies Program provides undergraduate students with a multidisciplinary study of major contemporary, interrelated global issues: war, peace, and security; development, health, and human resources; environment and natural resources; and cross-cultural understanding.

Students interested in complementing their study with courses that emphasize these issues may work toward a certificate or a minor in global studies; or, if they are eligible, they may pursue an honors interdisciplinary major in global studies.

The Global Studies Program provides suitable background for a variety of careers. Depending on the choices made in shaping the program, it can provide a broad, integrated base for more specialized or advanced work in a variety of academic disciplines, or for the study of law. It also provides suitable background for work in international business and with international and governmental agencies.

Programs

Honors Major

The global studies honors major is a broadly conceived program that provides a great deal of flexibility yet at the same time has a definite structure. To be eligible, students must be in the College of Liberal Arts Honors Program. To fulfill the requirements of the major, students take a core curriculum of courses, develop a familiarity with one major world area, develop usable skills in a language of that area, study in some depth one of three areas of topical concentration, and complete a senior All students take the following core curriculum of 27 semester hours.

Group A

47:1 Global Interdependence and Human Survival
47:180 Global Studies Seminar

Group B

Four courses chosen from the following:

6E:125 International Economics
16A:152 United States in World Affairs 1900-1975
or
30:162 American Foreign Policies

30:160 International Politics
or
30:60 Introduction to International Relations

30:170 The Politics of International Economics
47:150 Perspectives in Global Studies

91:193 Human Rights in the World Community: Problems of Law and Policy
or
91:195 Introduction to Public International Law

Group C

All of these:

16:143 War and Society
or
30:166 Politics of War and Peace

44:19 Contemporary Environmental Issues

19:157 Third World Development Support
or
30:150 The Political Economy of the Third World
or
113:151 Sociology of the Third World

World Area

Students take 12 semester hours of courses that focus on a major world area other than the area with which the student is primarily familiar.

Areas for which there are sufficient course offerings at The University of Iowa are listed below. Students who wish to study a particular area for which courses are not available in sufficient number, may take the courses at another institution and transfer them, with the approval of the program chair.

Asia
China
Japan
India

Western Europe
France
Germany
Great Britain
Western Europe as a unit

Eastern Europe and/or the Soviet Union

Latin America

Africa

The Middle East

Language

Each student is required to demonstrate an ability to use a foreign language that is widely used in the world area studied. The details of this requirement are worked out on an individual basis. In no case is the requirement less than that for the B.A. degree of the College of Liberal Arts and it commonly requires more work. Because of the additional time required for Chinese, Japanese, or Russian, students who elect these languages may count some semester

hours of language study (6 for Chinese and Japanese and 3 for Russian) as partial fulfillment of the world area requirement.

Topical Concentration

Each student develops a topical concentration (12 semester hours) focused on one of the following:

War, peace, and security;
Development, health, and human resources; or
Environment and natural resources.

Senior Honors Project

Each student completes an honors project, usually during the senior year. Students sign up for 3 semester hours of research on the project.

Certificate Program

The Certificate Program in Global Studies is designed to provide an international and global orientation for students in a variety of majors. Students in such diverse fields as engineering, business, anthropology, journalism, history, economics, and political science have completed the certificate program.

Students complete all requirements for their departmental major as well as the requirements of the certificate program. Courses counted for the major also may be counted for the certificate. Those who complete the requirements are awarded a certificate in global studies when they receive their bachelor's degrees, and the completion of the program is noted on their transcript.

Requirements

Students in the certificate program must take courses in the basic area, in each of four emphasis areas, and in a foreign language.

Basic Area

All students must take the following.

Both of these:

47:1 Global Interdependence and Human Survival (3 s.h.)
47:180 Global Studies Seminar (3 s.h.)

One of the following courses (3 s.h.):

6E:125 International Economics
16A:152 United States in World Affairs 1900-1975
30:60 Introduction to International Relations
30:160 International Politics
30:162 American Foreign Policies
30:170 The Politics of International Economics
47:150 Perspectives in Global Studies
91:193 Human Rights in the World Community: Problems of Law and Policy
91:195 Introduction to Public International Law

Emphasis Areas

Each student will take one course in three of the following areas, and three courses in a fourth. The first course to be taken is indicated. A list of the additional courses which can be counted under each area is available from the program director.

War, Peace, and Security

This component of the Global Studies Program deals with the use of armed force for pursuit of political ends on a continuum ranging from potential global nuclear war to individual acts of terrorism. The approaches consider cause, effect, limitation, and resolution of violence in the contemporary world.

16:143 War and Society
or
30:166 Politics of War and Peace

Development, Health, and Human Resources

This component deals with the problems of developing societies within the framework of a competitive global economy.

19:157 Third World Development Support
or
30:150 The Political Economy of the Third World
or
113:151 Sociology of the Third World

Environment and Natural Resources

This component is concerned with the use, availability, and disposal of global resources. Of special concern are environmental problems that arise from the transformation of these resources by humans using modern technology.

44:19 Contemporary Environmental Issues

Cross-Cultural Understanding

Global issues require for their analysis and solution persons educated to understand that perceptions, values, and beliefs vary among societies; that these differing values complicate the process of people communicating about and arriving at possible solutions; and that without careful examination, it is risky to accept as absolutes the perceptions, values, and beliefs of any one society or culture.

The goals of this component are to highlight cross-cultural differences as a major contemporary global issue; to address some of the sources, dimensions, and policy implications of these value differences; to foster the cross-cultural sensitivity necessary for dealing with global issues; and to encourage students to clarify their own values as they bear on the analysis of global problems. Students who choose to take three courses in this area should select three courses that bear on the history, culture, and politics of a single major world region. Students who take just one course should take the following:

113:3 Introduction to the Study of Culture and Society

Foreign Language

All certificate program students are required to complete two years of study of a foreign language or equivalent, and are encouraged to go beyond this minimal requirement.

Minor

The requirements for the global studies minor are the same as those for the certificate, except that courses taken in the student's major department do not count toward the minor.

Courses

47:1 Global Interdependence and Human Survival **3 s.h.**
Introductory analysis of the global system and its major problems; basic information, methods of understanding, interconnectedness of problems, identification and evaluation of some proposed solutions. GER: social sciences. Offered fall semesters.

47:80 Freshmen Honors Seminar **3 s.h.**

47:100 Problems in Global Studies **arr.**
Content varies; depending on subject matter in a particular semester, it may be substituted for one of the courses listed among the four divisions of global studies. May be repeated with consent of instructor.

47:105 Individual Projects in Global Studies **arr.**

47:107 Contemporary European News Colloquium **arr.**

47:150 Perspectives in Global Studies **3 s.h.**
Analysis of approaches to global studies; emphasis on ideological presuppositions, integrative power, and adequacy in the face of criticisms arising from more traditional academic disciplines.

47:160 International Security Affairs **3 s.h.**
Review and critical analysis of security policies and military postures of the United States, the Soviet Union, and their allies; key political and technical developments since World War II considered as basis for understanding current status of East-West confrontation.

47:180 Global Studies Seminar **3 s.h.**
In-depth exploration of a global problem or geographic area; interdisciplinary approach; distinguished guest speakers from on and off campus. May be repeated with consent of global studies chair. Offered spring semesters.

47:193 Human Rights in the World Community: Problems of Law and Policy **3 s.h.**
Same as 91:193.

47:195 Introduction to Public International Law **3 s.h.**
Principles of law that determine rights and duties of nations in their dealings with each other; contemporary international problems and controversies. Same as 91:195.

GREEK

See "Classics."

HISTORY

Chair: Lawrence E. Gelfand
Professors: R. David Arkush, T. Dwight Bozeman, Jeffrey L. Cox, Lawrence E. Gelfand, Jonathan A. Goldstein, Paul Greenough, Charles A. Hale, Sarah Hanley, Ellis W. Hawley, Henry G. Horwitz, Sydney V. James, Linda K. Kerber, Donald McCloskey, Allan Megill, Jaroslaw Pelenski, Malcolm J. Rohrbough, David Schoenbaum, Alan B. Spitzer, Stephen Vlastos
Professors emeriti: William O. Aydelotte, Ralph E. Giesey, Sidney Mead, Stow Persons
Associate professors: Mitchell Ash, Kenneth J. Cmiel, Steven L. Hoch, H. Shelton Stromquist, Katherine Tachau
Assistant professors: Constance H. Berman,

James L. Giblin, Susan Lawrence, Rebecca Rogers, Robert Weems
Undergraduate degree offered: B.A. in History
Graduate degrees offered: M.A., Ph.D. in History

The Department of History's purpose is to increase knowledge of human experience and provide students with opportunities to gain information about and learn methods for understanding their world in light of its past. In addition to offering these essential elements of liberal education, the department trains professional historians and teachers of history; serves those who require a knowledge of a period or aspect of history as background for their own specialized interests in other fields; and participates in several interdisciplinary programs, such as American studies, African-American world studies, Asian studies, Latin American studies, and women's studies.

Undergraduate Program

Baccalaureate graduates in history work in a variety of positions in business, public service, or journalism. Many plan further training in history, law, religion, library and information science, or social work.

A major in history includes work in other fields that will illuminate and expand the meaning of history courses as well as introduce the undergraduate to different bodies of information and approaches to understanding the ways societies and cultures work. For example, students majoring in history are encouraged to fulfill the College of Liberal Arts degree requirement in a foreign language by selecting a language that fits their interests in history.

The general major is for students with a general interest in history. The program requirements are:

A minimum of 24 semester hours in courses offered by the Department of History numbered 16:51 or higher, of which at least 12 semester hours must be in non-U.S. history courses; this limitation is imposed to assure acquaintance with the history of at least one other society besides our own.

Three semester hours in 16:51 Colloquium for History Majors; a colloquium consists of a small number of students collectively studying problems in ways that give training and experience in group discussion, analysis, and criticism; it is best taken after the student has finished a number of other history courses.

A minimum of 16 to 18 semester hours of course work in related areas, such as anthropology, economics, fine arts (excluding studio courses), geography, literature (excluding workshop courses), philosophy, political science, psychology, religion, and sociology, or a second major in one of these areas; courses taken to satisfy General Education Requirements will not be counted toward the related-areas requirement.

Of the 24 semester hours of history required for the major, 12 (including the 3 semester hours of colloquium) must be taken in residence at The University of Iowa. Credit earned through the College-Level Examination Program (CLEP) may not be counted toward the major.

Students may not receive credit toward the General Education Requirement in historical perspectives by taking any of the following courses taught by members of the history faculty: 16:10-18 Problems in Human History, 16:1 Western Civilization to 1792, 16:2 Western Civilization Since 1792, and 16:5-6 Civilizations of Asia. Nor may any of these courses be included in the 24 semester hours of history required for the general major in history.

Teacher Certification

Students majoring in history who wish to qualify for a teaching certificate must choose an area of concentration in history and meet the following requirements.

American History Concentration

Courses in U.S. history (including 16:51 Colloquium for History Majors)	30 s.h.
Courses in related areas	24 s.h.

Students must select 12 semester hours of course work in each of two related areas chosen from economics, geography, world history (non-U.S.), political science, sociology.

Students also must meet a special requirement in early European history by taking a 100-level course covering a period prior to 1750. This course also may be counted toward the related-area requirement in world history if that is one of the two areas chosen.

Courses in economics, geography, political science, or sociology that have been taken to satisfy the General Education Requirement in social sciences may be applied to the required hours in related areas, but no more than one such course may be applied to any one related area.

World History Concentration

Courses in non-U.S. history (including 16:51 Colloquium for History Majors and a 100-level course covering a period prior to 1750)	30 s.h.
Courses in related areas	24 s.h.

Students must select 12 semester hours of course work in each of two related areas chosen from economics, geography, American history, political science, sociology.

Courses in economics, geography, political science, or sociology that have been taken to satisfy the General Education Requirement in social sciences may be applied to the required hours in related areas, but no more than one such course may be applied to any one related area.

Students seeking the teaching major in history also must complete the professional courses in the College of Education that are required for teacher certification. They should consult an adviser in social studies education (see the "College of Education" section of the *Catalog*).

Honors

The honors major is for students of superior ability who want a flexible program that enables them to pursue special interests and enjoy the experience of individual research. To undertake the honors major in history, students must be admitted to the College of Liberal Arts Honors Program by the director of that program, and to the honors program in history by the department. Application should be made by the beginning of the junior year and may be made earlier. Successful completion of the honors major leads to the Bachelor of Arts degree with honors in history. Requirements are:

A minimum of 24 semester hours in courses offered by the Department of History, of which at least 12 semester hours must be in non-U.S. history; a minimum of 16-18 semester hours in related courses (see general major in history); at least 9 semester hours in the department's honors courses, which may include up to 6 semester hours of honors essay credit.

Successful defense of an honors essay.

Honors credits may be obtained in honors seminar, honors tutorial, and supervised research for the honors essay. (The honors seminar fulfills the colloquium requirement of the general major.) The honors essay should be a 30- to 40-page paper based on some research in primary sources; a committee of three faculty members will hear a defense of the essay, usually in the twelfth week of the student's final semester.

Minor

A minor may be earned by any student who completes at least 15 semester hours in history with a grade-point average of 2.00. Twelve of the 15 semester hours must be in advanced courses taken at The University of Iowa. For the minor, all courses above 16:71 are regarded as advanced.

Graduate Programs

The graduate programs in history prepare students for occupations such as high school or college teaching, publishing, commercial research, and government or other public service. With additional specialized training, students of history become qualified for careers in archival work, library work, museum work, or historical site preparation and display. Some students enter the joint program leading to degrees in both law and history (see "Joint Law and Graduate Degree Program" in the "College of Law" section of the *Catalog*).

Qualified graduate students are invited to apply for fellowships and assistantships. Inquiries should be directed to the departmental office.

Master of Arts

There are two M.A. programs in the history department. The first is for students who plan to work toward the Ph.D. degree. It requires a minimum of 30 semester hours of credit, including the completion of a research essay. The candidate must earn at least 24 semester hours of credit in the history department, including at least two seminars or one seminar and one readings course. One seminar or readings course must be taken in each of the first two semesters of residence. Twelve semester hours must be in the area of the student's essay topic, and at least six semester hours must be in a second division, including either a seminar or a readings course.

The essay in the major division must be based on original research and should be approximately 10,000 to 15,000 words in length. It usually begins as a term paper for the seminar in the major division and is completed the following semester under the guidance of the supervisor, when the student is enrolled in 16:296 Individual Study: Graduate. The finished product should emulate the character of articles in learned journals, just as the Ph.D. dissertation takes the form of a full-length scholarly monograph.

The alternate plan for the M.A. is designed for students who do not intend to pursue the doctorate in history. The basic course requirements are much the same as those for the Ph.D.-track M.A. They are: 30 semester hours overall; 24 in history; 12 in one major division, including a minimum of just one readings or seminar course. The two plans differ mainly in respect to concentration in fields: the Ph.D. track emphasizes the development of research capabilities culminating in the essay; the alternate plan stresses breadth of learning. Students in the alternate plan must take at least 6 semester hours in each of the other two divisions in history, or 6 semester hours in one other division in history and 6 semester hours in a related department. Included in these 12 semester hours must be at least one readings or seminar course in history.

After completing these requirements, or during the semester in which they are to be completed, the M.A. candidate must take an oral and written comprehensive examination in the major division.

Doctor of Philosophy

Students who earn the M.A. with research essay are admitted to the Ph.D. program on the favorable recommendation of the examining committee. Students who earn an M.A. at another university must meet the general requirements for admission to the Graduate College (see the "Graduate College" section of the *Catalog*) and must submit a specimen of their writing, such as a seminar paper or an M.A. thesis. They must take a research seminar during their first two semesters in residence at Iowa.

The candidate must earn at least 72 semester hours of credit, including credit for work done toward the master's degree. The 72 semester hours must include at least 32 semester hours (eight courses) in 200-level history courses, apart from thesis credit. At least 20 of these 32 hours must be completed before the student takes the comprehensive examination, and at least 20 of these 32 hours must be completed at The University of Iowa. Research seminars taken at the M.A. level may be counted toward this 32-hour requirement. The candidate also must earn 2 semester hours of credit in the philosophy of history, historiography, or methods of historical research.

The department has no common language requirement for the Ph.D., but the supervisor may require the candidate to demonstrate a reading knowledge of one or more foreign languages and proficiency in the use of other study tools. The candidate may not complete the comprehensive examination until these requirements have been met.

The comprehensive written and oral examination covers three distinct fields, two of which must be in a major division that is chosen from the following divisions:

The ancient world

Medieval Europe

Europe, including Great Britain, 1500 to 1815

Europe, including Great Britain, 1815 to present

Russia and the Soviet Union

United States history

Latin American history

Chinese history

Japanese history

History of India

Economic history

Military history

The third field must be either in a division outside the candidate's major division or in a related department outside history. The committee may define and delimit the individual fields for examination. It may also set, separately for each field, the character of the written portion of the comprehensive examination, which may take the form of a syllabus, a critical bibliography, a topical paper, or any other form or combination of forms that the committee deems suitable. The oral portion of the comprehensive examination will focus on issues and problems arising from the examination papers.

Graduate Admission

Applicants for admission to the graduate program in history must meet the general requirements for admission to the Graduate College: academic transcripts, letters of reference, and Graduate Record Examination (GRE) General Test scores. In addition, students must submit examples of original writings to the history department, such as term papers, seminar papers, or a thesis. These materials must be submitted by April 10 for admission to the summer session or fall semester, or by November 10 for spring semester. The application for graduate awards form is separate, with a February 10 deadline.

New students applying for aid must submit the application for admission when they apply for aid, or earlier. Those wishing to be considered for the University-wide Iowa Fellows Program should have their applications completed by January 10.

Guide to Graduate Study

Further information on graduate study is contained in the department's *Guide to Graduate Study*, which can be obtained upon request from the history department. The guide is revised every spring to include the latest faculty listing, research interests of faculty members, and detailed regulations on study toward advanced degrees and other information of interest to prospective students.

Special Facilities

The University Libraries are strong in all aspects of U.S. history. The Main Library houses the Henry A. Wallace papers and related collections, as well as other unique materials. In European history, special strengths are in French and English materials. The Iowa State Historical Department in Iowa City and the Herbert Hoover Presidential Library in West Branch possess additional valuable research materials.

Courses

Courses numbered 16:1 through 16:20 are ordinarily taken by freshmen to satisfy the General Education Requirements in historical perspectives. They cannot be taken pass/nonpass even when they are taken as electives. History majors must have junior or senior standing in order to enroll in 16:51 or 16:104. Other courses numbered below 200 are open to freshmen who have already satisfied the General Education Requirement in historical perspectives. Most courses numbered below 200 are offered alternate semesters. Courses numbered 200 and above usually are offered as occasion demands.

16:000 Cooperative Education Internship **0 s.h.**

16:1 Western Civilization to 1792 **3 s.h.**
GER: foreign civilization and culture, historical perspectives.

16:2 Western Civilization since 1792 **3 s.h.**
GER: foreign civilization and culture, historical perspectives.

16:5 Civilizations of Asia **3 s.h.**
GER: foreign civilization and culture, historical perspectives. Same as 39:55.

16:6 Civilizations of Asia **3 s.h.**
GER: foreign civilization and culture, historical perspectives. Same as 39:56.

16:10 Problems in Human History: Foundations of Science from Copernicus to Einstein 3 s.h.
GER: historical perspectives.

16:11 Problems in Human History: The Vietnam War in Historical Perspective 3 s.h.
GER: historical perspectives.

16:12 Problems in Human History: Communities and Society in History 3 s.h.
GER: historical perspectives.

16:13 Problems in Human History: The Political Left in Modern History 3 s.h.
GER: historical perspectives.

16:14 Problems in Human History: European Conquest and Colonization, 1000-1800 3 s.h.
GER: historical perspectives.

16:15 Problems in Human History: Women and Society in Past Times 3 s.h.
GER: historical perspectives.

16:16 Problems in Human History: The Cold War 3 s.h.
GER: historical perspectives.

16:17 Problems in Human History: Twentieth-Century Crisis 3 s.h.
GER: historical perspectives.

16:18 Problems in Human History: Modern Imperialism 3 s.h.
GER: historical perspectives.

16:19 Problems in Human History: Modernization 3 s.h.
GER: historical perspectives.

16:20 Problems in Medieval Society 3 s.h.
GER: historical perspectives.

16:51 Colloquium for History Majors 3 s.h.
Topics vary. May be repeated. Open only to history majors or others by consent of instructor.

16:71 Social Science Perspectives on Contemporary Africa 3 s.h.
Introduction to social science studies in Africa. GER: social sciences. Same as 129:71, 141:71.

16:81 Problems of Theory 2-4 s.h.
Theoretical issues not usually accommodated well in history courses; focus on their histories.

16:99 Historical Background of Contemporary Issues arr.
Topics vary.

16:100 Historical Background of Contemporary Issues arr.
Topics vary. May be repeated.

16:101 Individual Study: Undergraduate arr.
Subjects not covered in other courses. Consent of instructor required. May be repeated.

16:102 Honors Tutorial arr.
Individual study for honors majors. May be repeated.

16:103 Honors Essay arr.
Supervised research and writing. May be repeated.

16:104 Honors Seminar arr.
Colloquium for honors majors. May be repeated.

16:110 Topics in Latin American History 3 s.h.

16:111 Colonial Latin America 3 s.h.
Emphasis on elements of cultural and institutional continuity from the sixteenth century to independence. GER: foreign civilization and culture.

16:112 Introduction to Modern Latin America 3 s.h.
Emphasis on elements of cultural and institutional continuity from independence to the present. GER: foreign civilization and culture.

16:113 The Mexican Revolution 3 s.h.
Emphasis on Mexico's social upheaval of 1910-40 and its relation to nineteenth-century and contemporary patterns. GER: foreign civilization and culture.

16:114 Latin American Studies Seminar: The Cuban Revolution arr.

16:120 History of Pre-Colonial Africa 3 s.h.
Survey of sub-Saharan African history to 1880. Same as 129:163, 141:120.

16:121 History of Colonial Africa 3 s.h.
From the partition of Africa by European powers in the late nineteenth century to independence in the 1960s. Same as 129:164, 141:121.

16:122 Modern African History 3 s.h.
Selected topics in the history of Africa; topics vary. May be repeated. Same as 129:170, 141:122.

16:123 Topics: Modern African History 3 s.h.
Same as 129:186, 141:123.

16:124 Women in African History 3 s.h.
Theories about the creation of patriarchy applied to Africa; initiation rituals and gender/gender roles; gender divisions of labor and historical changes in them; women in labor migration systems and their role in reproduction; women and slavery; 20th-century women in urban and peasant societies; female prostitution; women's political movements in South Africa; the 1929 women's tax revolt in Nigeria; women and Islam. Same as 129:162, 131:162, 141:124.

16:125 The History of South Africa 3 s.h.
Same as 129:187.

16:131 Ancient and Medieval Science 3 s.h.
Beginning with the Greeks' initiation of scientific inquiry, course covers developments in astronomy, cosmology, optics, mathematics, physics, medicine, and psychology in the ancient and medieval societies of the Middle East and Europe.

16:132 The Scientific Revolution 3 s.h.
The emergence of modern science from the Renaissance to the Enlightenment: background and structure of the scientific revolution; relation of science to magic, religion, and philosophy; development of scientific communities and the relation of science to society.

16:133 Science in the Modern Age 3 s.h.
Science, culture, and society from evolutionary biology to the computer age: shift from classical physics to relativity, rise of psychology as science, genetic code and ethology, professionalization of science.

16:134 Science and Society 3 s.h.
Science, religion, and politics from Galileo to Newton; science and the Industrial Revolution; social Darwinism and the eugenics movement; women and science; science and the military.

16:135 History of Modern Psychology 3 s.h.
Psychological thought and research since Descartes: rise of experimental psychology in Germany and the United States; psychoanalysis, intelligence testing, behaviorism, and cognitive science in social and cultural contexts.

16:136 History of Medicine in Western Society 3 s.h.
Development of theories about the body, illness, and medical practice in their social, economic, and intellectual contexts; topics include the role of healers and professionalization of practitioners, evolution of public and private medical institutions, and interrelationships of science, medicine, and technology.

16:137 Topics in the History of Public Health 3 s.h.
Historical and contemporary problems of medicine, public health, and health-care delivery in non-Western world; emphasis on European encounter with distinctive medical systems and health specialists in colonial and postcolonial Asia.

16:138 History of International Health 3 s.h.

16:139 Medicine, Science, and Social Change 3 s.h.
Selected topics in the history of medicine. May be repeated.

16:141 The Arab-Israeli Conflict 3 s.h.
Directed reading and discussion of origins of Zionism and Arab nationalism, and Middle East in world politics since the nineteenth century.

16:143 War and Society 3 s.h.
Military profession, strategic thought, conduct of war, and civil-military relationships during the past 200 years.

16:145 Women and War 3 s.h.
The new scholarship that challenges the traditional allocation of domestic and social history to women and political and military history to men; interdisciplinary course involving art, literature, politics, and history. Same as 131:145.

16:172 Japan: 1800-1900 3 s.h.
Same as 39J:172.

16:173 Japan: 1900-1945 3 s.h.
Same as 39J:173.

16:174 Japan: 1945 to Present 3 s.h.
Same as 39J:174.

16:181 Contemporary Asia: News Colloquium 2 s.h.
Readings and discussion of contemporary Asian affairs as reported in the Asian and Western press, emphasizing political and economic themes. Offered only satisfactory-unsatisfactory. May be repeated. Same as 39:150.

16:182 The Vietnam War in Historical Perspective 3 s.h.
Same as 39:132.

16:183 Colloquium in Modern Asia arr.
Reading and discussion; topics vary. May be repeated.

16:184 Seminar in Modern Asia 3 s.h.

16:192 The Images of Modern Indian Women 3 s.h.

16:193 History of Ancient and Traditional India 3 s.h.
Social and cultural survey of India from the Harappan period to approximately 1500 A.D. GER: foreign civilization and culture. Same as 39:133.

16:194 Imperialism and Modern India 3 s.h.
Indian history since 1500 A.D., emphasizing Mughal and British imperial systems, nationalist movements, and current socioeconomic trends. GER: foreign civilization and culture. Same as 39:134.

16:195 Traditional China 3 s.h.
Development of Chinese civilization in premodern times, emphasizing ideas, social life, and government institutions. GER: foreign civilization and culture. Same as 39:153.

16:196 Modern China: 1800 to Present 3 s.h.
Impact of the West, decline of old China, intellectual change, the Chinese revolution, building a "new China" since 1949, the Cultural Revolution, post-Mao reforms. GER: foreign civilization and culture. Same as 39:154.

16:197 Premodern Japan 3 s.h.
Japanese development through the Tokugawa period; emphasis on development of Japanese feudalism; relations with China and the West. GER: foreign civilization and culture. Same as 39J:153.

16:198 Modern Japan 3 s.h.
Transformation of feudal Japan into a world power; emphasis on internal modernization and Japanese imperialism. GER: foreign civilization and culture. Same as 39J:154.

American History

16A:60 Introduction to Afro-American Society 3 s.h.
General works in anthropology, sociology, and history provide a framework for introduction to social and cultural history of Afro-Americans. GER: social sciences. Same as 129:60.

16A:61 American History 1492-1877 3 s.h.
Main themes from discovery through Civil War and Reconstruction; emphasis on social history of the colonial era and social, economic, and political developments of Revolutionary and antebellum periods. Satisfies the historical perspectives GER only for international students who hold a nonimmigrant student visa.

16A:62 American History 1877-Present 3 s.h.
Main themes since the Civil War; emphasis on social and political developments of the Gilded Age, Progressive Era, Great Depression; the United States as a world power. Satisfies the historical perspectives GER only for international students who hold a nonimmigrant student visa.

16A:72 Religion in American History 2-3 s.h.
Protestant, Catholic, and Jew from colonial era to present. Same as 32:20.

16A:110 Law in American History I 3 s.h.
Survey of American legal thought and experience from the beginning of the colonial period until approximately 1900. Consent of instructor required. Same as 91:293.

16A:111 Law in American History II 3 s.h.
Continuation of 16A:110, beginning from approximately 1900 to the present. Prerequisite: graduate standing or consent of instructor. Same as 91:294.

16A:119 Religion in American Culture 2-3 s.h.
The historical interplay between religious movements or ideas and society at large. Same as 32:145.

16A:120 Readings in Religion in American History arr.
Same as 32:140.

16A:121 Puritanism in Old and New England 2-3 s.h.
Historical survey; analysis of concepts of the sacred book, redemption, the world's end, church and state, family, women, Indians, sex. Same as 32:142.

16A:122 Varieties of American Religion 2-3 s.h.
Survey of distinctive groups: Mormons, Christian Scientists, Jehovah's Witnesses, Black Muslims, Unification Church of Sun Myung Moon. Same as 32:141.

16A:123 Religious Thought in America 1607-1860 2-3 s.h.
Religious factor in the life of the mind in America, with reference to selected leaders of American thought during this era. Same as 32:143.

16A:124 Religious Thought in America 1860-Present 2-3 s.h.
Religious factor in the life of the mind in America, with reference to selected American thinkers. Same as 32:144.

16A:127 American Intellectual History 1607-1865 3 s.h.
Survey of history of ideas and information; intellectuals and institutions from science, explorations, art, politics, and literature.

16A:128 American Intellectual History from 1870 3 s.h.
Continuation of 16A:127, beginning with the end of the Civil War.

16A:131 The Frontier in American History to 1840 3 s.h.

16A:132 The Frontier in American History 1840-Present 3 s.h.

16A:133 The American West in Film 3 s.h.
Western film from the turn of the century to the present vis-a-vis the background of historical experiences of the frontier West.

16A:134 Great Plains 3 s.h.

16A:137 History of Iowa to 1900 3 s.h.
Iowa history within the context of American development.

16A:138 History of Iowa since 1900 3 s.h.
Political, economic, and social changes, with special reference to two world wars, prosperity, depression, and the growing influence of national life.

16A:141 American Working Class to 1900 3 s.h.
Industrialization and the formation of an American working class; changing patterns of labor organization, strike activity, and politics; impact of ethnic, racial, and gender divisions on working class communities and culture.

16A:142 American Labor in the Twentieth Century 3 s.h.
Competing philosophies and organizational strategies of workers in a maturing industrial economy; particular attention to the impact of the world wars and the Great Depression on American workers and their unions; the rise of a service sector and deindustrialization.

16A:144 American Economic History 3 s.h.
Same as 6E:151.

16A:146 Immigrant America, 1845-1925 3 s.h.
Era of mass immigration to America in a world context; formation and organization of immigrant communities; diverse processes of adaptation and assimilation; rural and urban contrasts; coercive Americanization and immigration restriction.

16A:151 United States in World Affairs to 1900 3 s.h.
Origins of modern diplomatic practices, including problems of security, territorial and commercial expansion, and legal and constitutional problems.

16A:152 United States in World Affairs 1900-1975 3 s.h.
Emergence of America as a leader in world affairs, including problems of imperialism, international collaboration, and participation in two global wars and the Cold War.

16A:153 U.S.A. in a World at War 1931-1945 3 s.h.
The significance of World War II to the United States examined through documentary films with lectures and assigned readings; five hours of class time, including films.

16A:161 The Colonial Period in America 3 s.h.
Foundation and growth of English colonies in North America; colonial and imperial political history before 1715; economic and cultural history 1607-1750.

16A:162 American Revolutionary Period 1740-1789 3 s.h.
Political and military history of the colonies 1739-76; imperial upheaval; creation of federal system.

16A:163 United States in the Early Republic 3 s.h.

16A:164 Civil War and Reconstruction 3 s.h.
The military crisis, end of slavery, legal and social change.

16A:165 The Gilded Age in America 3 s.h.
The emergence of industrial and urban America, from the Civil War through the 1890s; emphasis on social and political developments.

16A:166 The Progressive Era in America 3 s.h.
The years of protest and reform, imperialism, and World War I, from the 1890s to 1920.

16A:167 The New Era and the New Deal 1920-1940 3 s.h.
United States in the interwar period; emphasis on the New Era system, the impact of the Great Depression and the responses of the Hoover administration, and the New Deal.

16A:168 The Contemporary United States 1940-Present 3 s.h.
United States as a global power; emphasis on World War II and the Cold War, recent patterns of social and economic change, and politics of the 1950s and 1960s.

16A:171 Women in America: Colonial Period to 1870 3 s.h.
American history through women's eyes, emphasizing interaction of biology, economics, politics, and ideology; special attention to how traditional historical generalizations are changed when women's experience is considered; legal history and women's education. Same as 131:171.

16A:172 Women in America: 1870-Present 3 s.h.
From passage of the Fourteenth Amendment to the present; emphasis on suffrage movement, economic roles, educational patterns; students may write a history of women in their own families. Same as 131:172.

16A:184 Topical Issues in Afro-American History 3 s.h.
Seminar on philosophical and political thought of Afro-Americans during the nineteenth and twentieth centuries. Same as 129:185.

16A:185 Afro-American History I, before 1865 3 s.h.
The early African-American experience: overview of life in Africa before the trans-Atlantic slave trade; dynamics of the slave trade; development and entrenchment of African slavery in mainland North America; conclusion of the Civil War. Same as 129:165.

16A:186 Afro-American History II, 1865 to Present 3 s.h.
Focuses on the abolitionist movement; Civil War and Reconstruction; evolution of Jim Crowism and emergence of twentieth-century protest groups. Same as 129:166.

European History

16E:106 Survey of Ancient Near East and Greece 3 s.h.
Social, economic, political, and intellectual history of ancient civilization, from its rise in Mesopotamia to the eve of Alexander the Great's conquests. GER: foreign civilization and culture.

16E:107 The Hellenistic World and Rome 3 s.h.
Social, economic, political, and intellectual history of the Graeco-Roman world, from fourth century B.C. to Justinian's reign. GER: foreign civilization and culture.

16E:108 National and Religious Resistance to Ancient Empires 2 s.h.
Study of this phenomenon in neo-Babylonian, Persian, and Hellenistic empires, and in Italy under the Roman Republic.

16E:110 Medieval Civilization 3 s.h.
Europe from the decline of the Roman empire to the Renaissance: cultural, political, and economic foundations of Western civilization. GER: foreign civilization and culture.

16E:111 Medieval Intellectual History 300-1150 3 s.h.
Survey of the philosophy, art, literature, and religious culture of Europe from late antiquity, when Europe gradually lost much of its classical intellectual modes of culture, to their recovery in the twelfth century.

16E:112 Medieval Intellectual History 1150-1500 3 s.h.
Medieval European philosophy, religion, literature, and art from the twelfth-century rise of scholasticism to their transformation in the period when Copernicus and Luther were trained.

16E:113 Economic and Social History of Medieval Europe 3 s.h.
Economic and social changes in western Europe from 300 to 1500 A.D.; feudalism, manorialism, revival of towns, heresy, women, monasticism, agricultural and commercial revolutions, and the Black Death. GER: foreign civilization and culture.

16E:114 Foundations of Anglo-American Law 3 s.h.
From the origins of the common law to early modern times; landlords and tenants, husbands and wives, justice as profession and ideal.

16E:116 Medieval England, 1066-1529 3 s.h.
From Norman conquest to eve of Protestant Reformation; problems of conquered country, feudalism and its decline, increase of wealth, origins of parliament.

16E:117 History of the Medieval Church 3 s.h.
Development of Christianity to end of the great schism; rise of Roman primacy, development of monasticism, and orthodox and heterodox groups. GER: foreign civilization and culture.

16E:118 Italy and the Mediterranean from 1000 to 1500 A.D. 3 s.h.
Social, economic, and cultural survey of Italy and its Mediterrean empires from the Crusades to the Turkish conquest.

16E:119 Women, Marriage, and Family in Medieval Europe 3 s.h.
Ordinary and extraordinary medieval European women and the social institutions of family and inheritance that affected their lives; marriage models, dowry and inheritance, work, literary and artistic contributions, religious benefactions, and religious life.

16E:120 The Book in the Middle Ages 3 s.h.
Role of books in medieval cultures, in creating textual communities; archaeology of the book, especially production, artistic embellishment, and value.

16E:121 The Italian Renaissance: Cultural Transmission of Learning, Law, and Art, 1250-1550 3 s.h.
Social, political, and intellectual assimilation of revived classical texts and the effects of humanist learning on the organization of families and city-states, history and law, and creativity in architecture, painting, and sculpture. GER: foreign civilization and culture.

16E:122 The European Religious Reformations, 1250-1750 2-3 s.h.
Comparative study of religious reformations (Catholic, Lutheran, Anglican, Calvinist, and radical sects) in France, Germany, and England; focus on shifting intellectual foundations and civic repercussions. GER: foreign civilization and culture.

16E:123 Political Culture in Early Modern France, 1500-1789 3 s.h.
Sociopolitical foundations of family formation and monarchic state building; the human divisions wrought by gender, slavery, and class; public discourse on social entitlement and growth of public opinion on the eve of the French revolution.

16E:124 European History in Text and Film, 1200-1800 3 s.h.
Social and cultural history; focus on customs and mentalities, politics and law, gender and class; written documents about people and events compared to filmed representations.

16E:125 Society and Gender in Europe 1200-1789 3 s.h.
How gender ideologies inscribed in patterns of authority (household, church, state), ranges of human endeavor (intellectual, psychological, biological), and community

organization (social, economic, legal, sexual) influence conceptions of community. GER: foreign civilization and culture. Same as 131:181.

16E:126 The Social and Political Origins of the French Revolution, 1500-1789 3 s.h.
Political theories, legal pacts, and social entitlements and the conflicting discourse about them in published works and underground pamphlets that sustained and undermined the monarchic state on the eve of the revolution.

16E:129 Topics in Modern European History, 1870-1980 3 s.h.

16E:131 England: Reformation to the Civil War 1509-1649 3 s.h.
Political and religious consequences of the English Reformation and of the economic development of the sixteenth and early seventeenth centuries.

16E:132 England: Civil War to the American Revolution 1649-1776 3 s.h.
England's development from the execution of King Charles I to the American Revolution.

16E:134 Nineteenth-Century Europe 3 s.h.
Main factors in European history: political, social, economic, and cultural. GER: foreign civilization and culture.

16E:135 Twentieth-Century Europe: The Nazi Era 3 s.h.

16E:136 Twentieth-Century Europe: The Cold War 3 s.h.

16E:145 French Revolution and Napoleon 3 s.h.
Antecedents of the revolution, principal developments in France, impact of the revolution on Europe. GER: foreign civilization and culture.

16E:146 France from 1815 to the Present 3 s.h.
Continuation of 16E:145. GER: foreign civilization and culture. May be taken independently.

16E:147 Analysis of French Politics and History 4 s.h.

16E:148 Society and Gender in Europe 1750-1950 3 s.h.
Investigation of social structures and gender roles in modern Europe; changes in politics, social organization, social relationship of the sexes (education, sexuality, occupation), forms of social protest (feminism, socialism). GER: foreign civilization and culture. Same as 131:182.

16E:151 Modern Britain 1760-1867 3 s.h.
British history from the Industrial Revolution to the mid-Victorian age.

16E:152 Modern Britain 1867-Present 3 s.h.
British history from the age of Gladstone and Disraeli to the present.

16E:155 Germany 1786-1914 3 s.h.
German-speaking states from the death of Frederick the Great to the outbreak of World War I; dynamics of political consolidation; rapid social and economic change; innovations in art and thought. GER: foreign civilization and culture.

16E:156 Germany since 1914: Weimar, Hitler, and After 3 s.h.
Continuity and change in twentieth-century German politics, society, and culture: the creation and collapse of the Weimar Republic; Nazism and the Third Reich; the development of the two German states since 1945. GER: foreign civilization and culture.

16E:161 The Enlightenment and Modern Thought 3 s.h.
Montesquieu, Diderot, Voltaire, Rousseau, and other eighteenth-century thinkers; significance of the Enlightenment to more recent thought.

16E:162 From Kant to Darwin 3 s.h.
Major themes in intellectual history, 1770-1860; dissolution of the Enlightenment, Romanticism, Historicism, Positivism.

16E:163 Origins of Contemporary Thought 3 s.h.

16E:164 Modern European Social Thought: Adam Smith to Marx 3 s.h.
Origins and early development of social theory; Smith, Bentham, Paine, Burke, Owen, Fourier, Mill, Proudhon, and other thinkers.

16E:165 Marx 3 s.h.
Analysis of origins and development of Marx's social and political theory.

16E:174 Medieval Russia 3 s.h.
Survey of major political, social, economic, cultural, and ideological developments in Old Rus' during the Kievan, Suzdal-Vladimirian, Galician-Volynian periods and in the city-states of Novgorod and Pskov (ninth to fifteenth centuries). GER: foreign civilization and culture.

16E:175 Muscovite Russia 1280-1598 3 s.h.
Major political, social, economic, cultural, and ideological developments in Muscovite Russia. GER: foreign civilization and culture.

16E:176 Imperial Russia, 1598-1801 3 s.h.
Survey of political, social, economic, cultural, and ideological developments in Imperial Russia. GER: foreign civilization and culture.

16E:177 Imperial Russia 1801-1917 3 s.h.
Major political, socioeconomic, ideological, and cultural developments in Imperial Russia. GER: foreign civilization and culture.

16E:178 Soviet Union 1917-1953 3 s.h.
History of the revolution and foundation of the Soviet Union: Leninism; major political, social, and ideological developments during the Stalinist period—collectivization, industrialization, terror; nationalities, foreign policy; World War II; Cold War; socialist state system. GER: foreign civilization and culture.

16E:179 Soviet Union 1953-Present 3 s.h.
Selected topics in the history of the Soviet Union: political system, ideology, socioeconomic developments, nationalities problems, and foreign policy. GER: foreign civilization and culture.

16E:181 Society and Gender in Europe 1450-1750 3 s.h.
Investigation of social structures and gender roles in late medieval and early modern Europe; patterns of authority (household, church, state), ranges of human endeavor (intellectual, psychological, biological), and community organization (social, economic, sexual).

16E:185 First World War 3-4 s.h.
Social, economic, political, technological, and military aspects of causes, conduct, and consequences of the war of 1914-18; readings in fiction, contemporary documents, and historical works; viewing of several films. Students who enroll for 4 semester hours must write a research paper.

16E:188 Contemporary European News Colloquium 3 s.h.

16:200 Statistical Methods in History arr.
Introduction to quantitative approaches to historical analysis.

16:208 Readings in Medieval Economic and Social History arr.

16:209 Seminar in Medieval Economic and Social History arr.

16:210 Readings: Medieval Women arr.

16:211 Seminar: Medieval Intellectual History arr.

16:212 Readings: Medieval Intellectual History arr.

16:213 Seminar: Medieval Society and Institutions arr.

16:214 Readings: Medieval Universities arr.

16:215 Seminar: Monastic History arr.

16:216 Readings: Feudal Society arr.

16:217 Seminar: Mediaeval Muslim and Jewish Philosophy arr.
Same as 32:212.

16:218 Medieval Latin Paleography arr.

16:219 Readings: Critical Theory and Interpretation in History arr.

16:220 Seminar: Early Modern Europe arr.

16:221 Readings: Early Modern France—Social and Intellectual History arr.

16:222 Seminar: Early Modern France arr.

16:223 Readings: Early Modern European Women's History arr.

16:224 Seminar: Early Modern European Women's History arr.

16:226 Readings: Early Modern England 1450-1750 arr.

16:228 Seminar: Law and Society: England 1500-1800 arr.

16:235 Seminar: Modern Europe arr.

16:236 Readings: Modern European History arr.

16:237 Seminar: Women in Modern France and Great Britain arr.
Comparative study of women's roles and experiences in nineteenth-century France and Great Britain until World War I; attention to shifting social, cultural, and political gender patterns; emphasis on issues of methodology applied to examination of domestic ideology, work, education, and the development of feminism.

16:239 Seminar: Modern Britain arr.

16:240 Readings: Modern Britain arr.

16:242 Readings: British Imperialism arr.

16:247 Seminar: History of Science arr.

16:248 Readings: History of Science arr.

16:249 Seminar: History of Medicine and Health arr.

16:250 Readings: History of Medicine and Health arr.

16:255 Seminar: Russian or Soviet History arr.

16:256 Readings: Russian History arr.

16:257 Readings: Soviet History arr.

16:258 Readings: Women in European History arr.

16:259 Seminar: Women in European History arr.

16:261 Seminar: American Colonial History arr.

16:262 Readings: American Colonial History arr.

16:265 Seminar: American Social History arr.

16:267 Seminar: Contemporary United States arr.

16:268 Readings: The Contemporary United States arr.

16:270 Readings in American Women's History arr.
Same as 131:270.

16:271 Seminar: American Frontier arr.

16:272 Readings: The American Frontier arr.

16:273 Readings in American Social History arr.

16:275 Seminar: American Religious Thought arr.
Same as 32:213.

16:276 Seminar: Puritanism arr.
Same as 32:214.

16:277 Seminar: American Foreign Relations arr.

16:278 Readings: American Foreign Relations arr.

16:279 Seminar: American Intellectual History arr.

16:280 Readings: American Intellectual History arr.

16:282 Readings: Nineteenth-Century American Cultural History arr.

16:283 Feminist Theory: Historians' Perspectives arr.
Same as 131:283.

16:284 Seminar: History of American Women arr.
Same as 131:284.

16:285 Seminar: Afro-American History arr.
Same as 129:285.

16:287 The Social History of the Artisan 3 s.h.

16:288 Readings: Latin American History arr.
Same as 35:247.

16:289 Seminar: Latin American History arr.

16:290 Seminar: Post Comprehensive arr.
Historical fields and methodologies; emphasis on presentation and criticism of research materials. For students who have passed the comprehensive examinations for the Ph.D. degree.

16:291 Seminar: Modern Chinese History arr.
Same as 39:254.

16:292 Readings in Chinese History arr.
Same as 39:258.

16:293 Readings: Vietnam War arr.

16:294 Readings: Japanese History arr.
Same as 39J:257.

16:295 Readings in the History of India arr.
Advanced readings in socioeconomic history of ancient and modern India. Same as 39:295.

16:296 Individual Study: Graduate arr.

16:297 Thesis arr.

16:298 Philosophy of History 3 s.h.

HOME ECONOMICS

Chair: Carolyn W. Lara-Braud
Professors: Lorraine T. Dorfman, Carol C. Fethke
Professors emeritae: Margaret N. Keyes, Naomi Schedl, Floy Eugenia Whitehead
Associate professors: Richard T. Cary, Carolyn W. Lara-Braud, Sara C. Wolfson
Associate professor emerita: Elizabeth Alden
Assistant professors: Alice Atkinson, Leslie Margolin
Assistant professors emeritae: Iva M. Bader, Mabel H. Parsons, Harriet A. Stevens
Undergraduate degrees offered: B.A., B.S. in Home Economics
Graduate degrees offered: M.A., M.S. in Home Economics

The Department of Home Economics is being phased out as a result of action taken by the State Board of Regents. No entering freshmen or transfer students may declare home economics as a major. Undergraduate students enrolled at The University of Iowa prior to June 1, 1989, will be permitted to declare home economics as a major only if the chair of the department determines that they can complete the required home economics courses before those courses are discontinued. No admissions will be accepted for graduate study in home economics.

Requirements for undergraduate and graduate degrees, the Cooperative Education/Internship Program, honors, and a minor in home economics remain the same as listed in the 1988-1990 *General Catalog*.

All instruction in home economics is scheduled to end May 31, 1992. Majors may have to postpone General Education Requirements, required non-home economics, and elective courses in order to complete all required home economics courses before this end date. Therefore, bachelor's degrees in home economics will be awarded until all full-time, continuously enrolled undergraduate home economics majors have completed the remaining degree requirements. Students not majoring in home economics may register for home economics courses where space is available.

Courses

Primarily for Undergraduates

17:000 Cooperative Education Internship 0 s.h.

17:9 Human Development and the Family 3 s.h.
Life-span human development; special emphasis on role of the family. Not open to seniors. Offered fall semesters.

17:10 Growth and Development of the Young Child 3 s.h.
Physical, cognitive, emotional, and social development of the young child; emphasis on the relationships between children and families. Offered fall semesters.

17:41 Introductory Nutrition 3 s.h.
Sociopsychological and environmental aspects of nutrition; basic principles in preparation of food products; composition of foods; qualitative and quantitative evaluation of diets using standard references; requires simple arithmetic operations. Offered fall semesters.

17:50 Design and the Environment 3 s.h.
Person/environment relationships in the home, workplace, and community; elements and applications of design as they relate primarily to interior spaces.

17:70 Introductory Clothing Construction 3 s.h.
Use and selection of sewing equipment, patterns, and fabric; construction techniques, processes, and principles.

17:72 Apparel, Fashion, and Selection 3 s.h.
Origins and functions of apparel; influence of culture and environment on apparel; fashion theories; apparel selection problems; special apparel needs—career wear, the handicapped, and the elderly. Offered fall semesters.

17:80 Textiles for Consumers 3 s.h.
Fibers; production and properties; yarn structure; fabric constructions and finishes; legislation and regulation; current consumer issues. Offered spring semesters.

For Undergraduates and Graduates

17:104 Adolescence and the Family 3 s.h.
Adolescent development within the context of family relationships and intergenerational influences; selected current issues.

17:106 Conflict and Violence in Families 3 s.h.
Dysfunction, conflict, and violence within families; causes, effects, and intervention techniques. Prerequisite: 17:9.

17:108 Basic Aspects of Aging 3 s.h.
Biological, social, and psychological aspects; emphasis on neighborhood and housing, clothing, and nutrition needs of older adults.

17:111 Management of Family Resources 3 s.h.
Management problems and practices from the viewpoints of systems and behavioral science; methods of decision making; resource allocation; time, stress, and energy management; personnel management; problems of families in crisis. Offered fall semesters. Prerequisites: 6E:1 or 6E:2, and junior standing.

17:112 Personal Financial Management 3 s.h.
Principles of family financial planning and portfolio management; budgeting, taxes, credit and borrowing, insurance, investments, retirement, and estate planning. Prerequisites: 6E:1 or 6E:2, and junior standing; or consent of instructor.

17:113 Marriage and Family Interaction 3 s.h.
Contemporary American marriage and family relationships; mate selection, marriage, and family interaction. Prerequisite: 17:9 or 31:1 or 34:1.

17:114 Parent-Child Relationships 3 s.h.
Synthesis and application of research in child rearing and parent/child relations. Offered spring semesters. Prerequisite: 17:10.

17:117 Human Sexuality 1-3 s.h.
Physiological and psychological aspects of human sexuality. Same as 96:112, 42:112, 7C:112.

17:120 Methods: Home Economics 3 s.h.
Philosophy, materials, and methods. Offered spring semesters. Same as 7S:125.

17:121 Curriculum: Home Economics 3 s.h.
Principles of curriculum planning; factors that influence home economics curricula; planning home economics curricula for various groups and situations.

17:122 Materials and Methods in Family Life Education 3 s.h.
Philosophy, resources, and methods of presenting family life education materials in elementary, middle, junior high, and high school, and in adult education. Same as 7S:126.

17:128 Evaluation: Home Economics 2 s.h.
Measurement and evaluation principles; selection and development of evaluation instruments and procedures for home economics.

17:130 Food Study and Meal Management Laboratory 3 s.h.
Basic scientific principles in preparation of standard food products; factors affecting management of food and its selection for meeting physiological and psychological needs with available resources; laboratory. Offered spring semesters. Prerequisite: 17:41.

17:133 Prenatal and Early Childhood Nutrition 3 s.h.
Special nutritional needs for optimum outcomes of pregnancy, lactation, growth, and development to the preteen years; focus on appropriate food selection and government assistance programs. Prerequisites: 17:41, and 17:9 or 17:10.

17:135 Nutrition for the Middle Years 3 s.h.
Nutritional needs of adolescents and detrimental effects of food/drug interactions, anorexia, bulimia, and adolescent pregnancy; emphasis on developing of food and health habits that minimize nutrition-related problems of later life. Prerequisites: 17:41, and 17:9 or 17:104.

17:138 Nutrition for the Later Years 3 s.h.
How body processes and nutritional needs change with aging; food/medication interactions; government food programs for the elderly. Prerequisites: 17:41, and 17:9 or 17:108.

17:142 Nutrition 3 s.h.
Principles of human nutrition. Not open to majors for degree credit. Offered only through Guided Correspondence Study. Prerequisites: 4:7 and 72:130.

17:144 Intermediate Nutrition 3 s.h.
Continuation of 17:41, with emphasis on intermediary metabolism and nutrient sources. Offered fall semesters. Prerequisites: 17:41, 17:130, 72:130, and 99:120.

17:145 Advanced Nutrition 3 s.h.
Continuation of 17:144, with emphasis on the primary research literature. Offered spring semesters. Prerequisites: 17:144 and 99:130. Corequisites: 37:128 and 37:129, or 37:150 and 37:152, or 99:140.

17:147 Diet Therapy 3 s.h.
Therapeutic use of diet in metabolic disturbances and in certain diseases. Offered only through Guided Correspondence Study. Prerequisite: 17:142, 17:144, or consent of instructor.

17:155 Survey of Historic Interiors 3 s.h.
Development of interior furnishings from the Egyptian period to the mid-nineteenth century; correlation with architecture and culture of the periods.

17:156 Survey of Modern Interiors 3 s.h.
Development of interior furnishings from the mid-nineteenth century to the present; correlation with architecture and culture of the nineteenth and twentieth centuries.

17:160 Printing and Dyeing 1-3 s.h.
Fabric problems; design complement techniques; photographic and other silkscreen methods; resist methods of image making; use of dyes such as fiberactive, indigo. May be repeated. Prerequisite: two basic studio courses or consent of instructor. Same as 1P:191, 49:153.

17:162 Weaving 1-3 s.h.
From basic techniques to complex two- and three-dimensional structures; emphasis on aesthetic concepts. May be repeated. Prerequisite: two basic studio courses or consent of instructor. Same as 1P:192.

17:164 Forms and Fibers 1-4 s.h.
Two- and three-dimensional fabric complexes that deal with expression, object, and illusion; techniques include nonloom, felt making, paper, and soft sculpture. May be

repeated. Prerequisite: one 100-level studio course or consent of instructor. Same as IP:193.

17:166 Housing: Social and Psychological Aspects 3 s.h.
Interrelationships among the physical environment, culture, and family needs; how social issues, public policy, and psychological needs are related to demand, supply, and design of housing. Prerequisite: General Education Requirement in social sciences.

17:170 Tailoring 2-3 s.h.
Analysis and solution of fitting problems; materials, designs, and construction techniques used in tailoring garments by traditional and contemporary methods; evaluation of tailored garments. Only students who have completed 17:171 may register for 2 s.h. Prerequisite: 17:70.

17:171 Fitting Problems and Flat Pattern Design 2-3 s.h.
Analysis and solution of fitting problems; principles of pattern design by flat pattern methods. Only students who have completed 17:170 may register for 2 s.h. Prerequisite: 17:70.

17:173 Fashion Merchandising 3 s.h.
Theory and concepts of retailing; application of concepts to the fashion apparel industry. Prerequisites: 6E:1, 6E:2, and 6M:100.

17:180 Textile Technology and Analysis 3 s.h.
Advanced study of chemical and physical properties of fibers, yarns, and fabrics; introduction to standard test methods and performance specifications for textile products. Offered fall semesters. Prerequisite: 17:80.

17:181 Textile Finishing, Dyeing, and Detergency 2-3 s.h.
Dyes, finishes, detergents: their classification, methods of application, and effect on serviceability of textiles. Prerequisite: 17:180 or consent of instructor.

17:183 Textile and Apparel Economics 3 s.h.
Economic and industrial history of textiles and apparel; current developments and problems in production and marketing. Offered spring semesters. Prerequisites: 17:80 and a course in economics, or consent of instructor.

17:185 Costume History I 1-3 s.h.
History of costume and fashion from its origin to the beginning of the English Restoration. Same as 49:101.

17:186 Costume History II 3 s.h.
History of costume and fashion from the English Restoration to present fashion trends. Same as 49:111.

17:190 Seminar: Home Economics 2 s.h.
Scope of home economics: its origin, development, philosophy, present status, and future direction; factors influencing curricula, research, and entire field; emphasis on home economics as an integrated field. Prerequisites: 17:9, 17:41, 17:50, and 17:80.

17:191 Honors Seminar: Home Economics 2-4 s.h.
Review of literature in areas of interest; open to majors and nonmajors. Consent of instructor required.

17:192 Honors Problems: Home Economics 2-4 s.h.
Research project or creative work; open to majors and nonmajors. Consent of instructor required. Prerequisite: 17:191.

17:193 Directed Studies arr.
Individualized tutorial in student's area of specialization. Consent of instructor required. Prerequisite: junior, senior, or graduate standing.

17:195 Home Economics Internship 0-4 s.h.
Work experience complementing student's courses; may be full- or part-time, with credit based on objectives and employment situation. May be repeated for up to 8 semester hours. Consent of departmental cooperative education representative required.

Primarily for Graduates

17:201 History and Philosophy of Home Economics 1 s.h.
Readings and interpretations of historical and current developments in home economics.

17:202 Research Methods 2-3 s.h.
Methods and techniques of research in home economics and closely allied fields. Prerequisite: a course in statistics or consent of instructor.

17:203 Form and Structure in Art 1-2 s.h.
Readings and discussion in visual education. Prerequisite: a 100-level studio course.

17:211 Individual and Family Development: Life Span 3 s.h.
Infancy through senescence, families from their beginnings through their later years; theoretical and methodological issues.

17:212 Theory and Research in Family Studies 3 s.h.
Review of research and theory in selected areas of family development and interaction.

17:219 Seminar: Family or Consumer Studies 2-3 s.h.
Selected topics and issues in family or consumer studies. May be repeated. Prerequisite: a graduate course in family science or consent of instructor.

17:223 Seminar: Home Economics Education 2-3 s.h.
Critical review of current literature in home economics education. May be repeated. Consent of instructor required.

17:235 Seminar: Food and Nutrition 2-3 s.h.
Critical review of current literature in food and nutrition. May be repeated. Consent of instructor required.

17:242 Seminar: Family Science 2-3 s.h.
Critical review of current literature in family science and related fields. May be repeated. Consent of instructor required.

17:245 Seminar: Educational Strategies in Family Science 2-3 s.h.
Methods in family life education, home economics education, and nutrition education. May be repeated. Consent of instructor required.

17:246 Readings in Family Science arr.
Individualized tutorial. May be repeated. Consent of instructor required.

17:250 Readings in Apparel, Fiber Art, Design 2-3 s.h.
Critical review of significant literature in the visual arts and the near environment.

17:260 Graduate Workshop in Fiber 1-3 s.h.
Advanced work in fiber art; emphasis on artistic expression. May be repeated. Prerequisites: 17:160, 17:162, and 17:164; or consent of instructor.

17:282 Experimental Textiles 2-3 s.h.
Individual or group projects conducted in the field or laboratory with discussion of results. Offered spring semesters of even years. Consent of instructor required.

17:290 Special Projects Seminar 1-4 s.h.
Individualized projects or field experience for nonthesis students. Consent of instructor required. Prerequisite: 30 semester hours of graduate credit.

17:291 Research Problems 1-3 s.h.
Preparation of research proposal by thesis students. Consent of instructor required. Prerequisite: 17:202 or 17:203.

17:292 Advanced Studio Problems 1-3 s.h.
Proposal writing and creative work for thesis students in fiber art and design. Consent of instructor required. Prerequisite: 17:203.

17:299 Thesis 1-4 s.h.
Consent of instructor required. Prerequisite: 17:291 or 17:292.

HOSPITAL AND HEALTH ADMINISTRATION

See "College of Medicine."

INTERDEPARTMENTAL STUDIES

Coordinator: Patricia Addis
Faculty advisory committee: David Reynolds (Geography), John Stratton (Sociology), Katherine Tachau (History)
Undergraduate degree offered: B.A.

Degree Program

The Bachelor of Arts in the Interdepartmental Studies Program (ISP) is designed to give students flexibility in planning their academic programs. Since this is an interdepartmental major, students are responsible for planning their own areas of concentration with the assistance of an interdepartmental studies adviser. ISP students may not earn minors.

Students in interdepartmental studies develop creative emphases that draw on the offerings of several departments and integrate varied approaches to a particular topic. A few examples of interdisciplinary programs are world order studies, environmental studies, technical writing, family studies, urban studies, and medieval culture. Programs that are covered by existing departmental majors are not appropriate for the ISP major. In all cases, careful and timely planning is essential.

Plan of Study

ISP students are required to submit for approval a plan of study. The earlier a plan of study is submitted, the more effective the student's program will be. Because the ISP major by definition allows for individualized academic programs, students are encouraged to apply for the program prior to or during the junior year.

Procedures through Summer 1991

Sophomores or juniors who declare the ISP major must submit a plan of study within three weeks after the declaration. The adviser will not sign subsequent registration cards until an approved plan of study is in the student's folder.

Senior students (those who have earned 90 semester hours or more) who wish to declare the ISP major must submit the plan of study for approval prior to the declaration. Students who have completed more than 94 semester hours ordinarily may not declare the ISP major unless they can demonstrate that the advanced course work would fit a coherent plan of study. **Note:** Declaring the ISP major late may result in the need to complete more than the minimum of 124 semester hours required for the degree.

Procedures Effective Fall 1991

The plan of study must be approved before students can declare the ISP major. Students must complete a minimum of 30

semester hours after entering the program, 15 of which must be in advanced-level course work. Hours taken during the semester in which the plan of study is approved are not counted as part of the final 30 semester hours.

Guidelines

Each plan of study submitted for approval must provide the following information:

A description of academic goals for the bachelor's degree, with a clear statement of the reasons for preferring the ISP to any departmental program;

A list of advanced-level course work already completed and a description of its relevance to the proposed plan of study; and

An outline of advanced-level course work planned for all remaining semesters, noting how the courses are related to each other, to personal interests, and to the central focus of the plan of study.

Each plan of study is approved by a committee that may include the coordinator, the faculty advisory committee, and ISP advisers. Reviews are held several times each semester.

If the committee does not grant approval, the plan of study may be returned to the student for revisions and resubmission at the next committee meeting. In some cases, the student may be referred to a more appropriate departmental major.

Students are required to take the courses approved in the plan of study. A limited number of substitutions may be allowed only if they are clearly consistent with the areas of concentration in the approved plan of study and only if they are approved in advance by the ISP adviser. Unauthorized substitutions may be designated as elective course work.

Significant changes in the focus of a student's plan of study require the submission and approval of a revised plan of study. The student's academic adviser determines whether changes warrant a revised plan.

Forms and guidelines for preparing the plan of study are available in the Bachelor of General Studies/Interdepartmental Studies Advisory Office, 113 Schaeffer Hall, or in the Office of Academic Programs, 116 Schaeffer Hall. A list of review committee meeting times is available each semester.

ISP Requirements

In addition to having an approved plan of study, students must complete the following requirements for the B.A. in interdepartmental studies.

General Education Requirements

Students must complete the College of Liberal Arts General Education Requirements, including four semesters of college-level foreign language or the equivalent. (See the College of Liberal Arts introductory section for specific information.)

Advanced Course Work

Students must complete at least 36 semester hours of advanced course work at The University of Iowa. No more than 18 semester hours of advanced course work from any one department may be counted toward fulfilling this requirement.

If more than 18 semester hours of advanced courses are taken in one department, however, the total may be counted toward the 124 semester hours needed for graduation.

Advanced courses typically are those numbered 100 and above. At the initiation of sponsoring departments and with approval of the Office of Academic Programs, courses numbered below 100 but taught at an advanced level also may be used to satisfy this requirement. Approved courses are listed later in this section.

The pass/nonpass grading option is not available for the 36 semester hours of advanced course work required for the degree, but may be used for advanced course work beyond the 36 semester hours.

Courses taken to satisfy the General Education Requirements may not be counted toward completion of the advanced course work requirement.

Some study abroad advanced course work is considered residential work for the purposes of ISP requirements and college residence requirements. Students should check in advance with their ISP academic adviser or with the ISP coordinator.

University of Iowa Guided Correspondence Study advanced courses count toward the advanced course work requirement, but the College of Liberal Arts residence requirement must be met by other UI course work.

Grade-Point Average

Students must achieve a grade-point average of at least 2.00 in all college work attempted; all college work undertaken at The University of Iowa; and all advanced courses attempted.

Total Hours Earned

Students must earn a minimum of 124 semester hours of credit.

Restrictions

No more than 40 semester hours of credit in one academic department may count toward the 124 semester hours required for graduation. This includes both upper- and lower-level course work, and both UI and transfer course work.

Students completing a B.A. in Interdepartmental Studies may earn no more than 30 semester hours of credit toward the 124 required for graduation from courses taken in all other colleges of the University (e.g., business administration, engineering). Undergraduate courses offered by the College of Education are an exception to this rule.

All other College of Liberal Arts policies regarding residence, pass/nonpass, satisfactory/fail, and academic standards apply to ISP students.

Advanced Courses Numbered below 100

The following courses are accepted as part of the 36 semester hours of advanced course work required under the ISP rules. Students must earn a grade-point average of 2.00 or higher in these courses and in those numbered 100 and above.

Advanced courses numbered below 100 that were taken before spring semester 1988 are not considered advanced-level course work. Some of the courses have prerequisites or require special permission signatures.

American Studies

45:90 Seminar in American Cultural Studies 3 s.h.

Art and Art History

1K:49 Advanced Painting 2-3 s.h.
1M:52 Undergraduate Printmaking II 3 s.h.
1N:17 Undergraduate Sculpture Workshop 3 s.h.

Asian Languages and Literature

39:23 Second-Year Sanskrit 3 s.h.
39:24 Second-Year Sanskrit 3 s.h.
39:50 Non-Western Literary Traditions 3 s.h.

Botany

2:3 Iowa Flora 2 s.h.
(accepted as advanced course work only if 2:101 Plant Taxonomy also is completed)

Communication Studies

All courses numbered 36B:60 and above
All courses numbered 36C:60 and above

Comparative Literature

48:40 Major Texts in World Literature I 3 s.h.
48:41 Major Texts of World Literature II 3 s.h.
48:50 Non-Western Literary Traditions 3 s.h.
48:95 Undergraduate Seminar 3 s.h.

Computer Science

22C:21 Algorithms and Data Structures 3 s.h.
22C:23 Programming Language Concepts 3 s.h.
22C:31 Digital Systems and Computers 3 s.h.
22C:32 Introduction to Systems Software 3 s.h.
22C:51 Computer Graphics 3 s.h.
22C:55 Elementary Numerical Analysis 3 s.h.

Dance

137:91 Independent Study	arr.
137:92 Independent Choreography	arr.

Dental Hygiene

60:2 Human Histology	4 s.h.

English

All courses numbered above 8:10 except 8G courses

Geology

12:41 Mineralogy	4 s.h.
12:52 Elementary Petrology	4 s.h.
12:92 Structural Geology	5 s.h.

Mathematics

22M:27 Introduction to Linear Algebra	4 s.h.
22M:28 Calculus III	4 s.h.
22M:41 Differential Equations for Engineers	3 s.h.
22M:42 Vector Calculus for Engineers	3 s.h.
22M:50 Elements of Group Theory	3 s.h.
22M:55 Fundamental Properties of Spaces and Functions	3 s.h.
22M:70 Foundations of Geometry	3 s.h.
22M:72 Elementary Numerical Analysis	3 s.h.

Music

25:144 History of Music I	3 s.h.
25:146 History of Music II	3 s.h.

Physical Education and Sports Studies

28:83 Psycho-Social Dimensions of Physical Activity	3 s.h.

Spanish and Portuguese

35:30 Spanish Conversation Junior Level	2 s.h.
35:35 Spanish Conversation Senior Level	2 s.h.

Statistics and Actuarial Science

22S:39 Probability and Statistics for the Engineering and Physical Sciences	3 s.h.

Theatre Arts

49:13 Shakespeare	3 s.h.
49:60 Play Script Analysis	3 s.h.
49:62 Basic Playwriting	3 s.h.

Related Considerations

All courses numbered with the prefix 7 (College of Education) are considered to be in one department.

All courses numbered with the prefix 6 (College of Business Administration) except 6E (economics is also considered a department in the College of Liberal Arts) are considered to be in one department.

Honors

ISP students qualify for membership in the College of Liberal Arts Honors Program by maintaining a cumulative grade-point average of at least 3.20. Graduating with honors usually includes the successful completion of the honors requirements in a particular department. A list of departmental requirements is available from the College of Liberal Arts Honors Program or from the ISP coordinator.

ISP students should initiate inquiries about graduating with honors by contacting the director of the College of Liberal Arts Honors Program at the Shambaugh House Honors Center. Students are encouraged to inquire early in their junior year to allow time for foundation course work. The honors director offers suggestions for contacting a supervising faculty member or committee from one or several appropriate departments.

Career Considerations

Since the B.A. degree in Interdepartmental Studies affords opportunities outside the traditional degree pattern, students must create programs of study that meet their individual educational and career objectives. Those who plan to seek employment immediately following graduation should familiarize themselves with the educational background and qualifications required by employers and should include appropriate courses in their programs of study.

Students preparing for advanced study should become familiar with the admissions requirements of graduate or professional schools. The earlier students decide on pursuing graduate or professional study, the easier it is for them to complete any necessary prerequisites.

ISP students who design a cohesive program and maintain a competitive grade-point average may be considered equally with students who earn other undergraduate degrees for employment or admission to some graduate and professional schools.

For More Information

Information about the Interdepartmental Studies Program is available from the Bachelor of General Studies/ Interdepartmental Studies Advisory Office, 113 Schaeffer Hall.

Courses

145:000 Cooperative Education Internship **0 s.h.**

IOWA LAKESIDE LABORATORY

Acting director: Robert W. Cruden
Professors: George G. Brown (Zoology, Iowa State University), Robert W. Cruden (Botany, The University of Iowa), Lawrence J. Eilers (Biology, University of Northern Iowa), Edwin Powell (Zoology, Iowa State University), Lois H. Tiffany (Botany, Iowa State University)
Visiting professors: Barbara Abram (Biology, Hampton University, Virginia), Neil Bernstein (Biology, Mount Mercy College, Iowa), Paul Christiansen (Biology, Cornell College, Iowa), Richard Lampe (Biology, Buena Vista College, Iowa), Michael J. Lannoo (Zoology, Ohio University, Athens), Eugene Stoermer (Great Lakes and Aquatic Sciences, University of Michigan)

The Iowa Lakeside Laboratory is a biological field station comprising approximately 140 acres of grassland and gallery forest along the west shore of Lake West Okoboji in northwest Iowa.

The laboratory was established in 1909 under the leadership of Thomas H. Macbride, whose eminence as a University of Iowa botanist and geologist from 1878 to 1914 was recognized by his appointment as University president from 1914 to 1916. The lab site was the first area set aside for the conservation and study of the rich flora and fauna of the northern Iowa lake and prairie regions.

Since 1947, The University of Iowa has cooperated with Iowa State University and the University of Northern Iowa in the lab program. Representatives of the three schools make up an advisory board, which determines the scientific and educational policies of the lab.

The Iowa Lakeside Laboratory offers course work in two five-week terms during the summer session. Enrollment is limited to one course per term, for 5 semester hours of credit.

The laboratory gives advanced undergraduate and graduate students the opportunity to study plant and animal life in its natural setting. The courses have a strong discussion/field work/ project orientation that supplements the formal lecture/laboratory course work on the three campuses.

Students working for advanced degrees find excellent opportunities to develop thesis projects at the lab.

Teaching and research facilities include seven laboratories, a library, and a lecture hall. Living accommodations include cottages, dormitories, and a large mess hall.

Financial Aid

The University of Iowa has established several Thomas H. Macbride Scholarships in Natural Science for undergraduate and graduate students attending the lab. The scholarships cover Iowa Lakeside Laboratory tuition costs. Scholarship applications close April 1.

Registration

Current or former students of The University of Iowa, the University of Northern Iowa, and Iowa State University may enroll in those institutions with the registration form in the Lakeside Laboratory bulletin. Students from other institutions must apply for admission to one of the three cooperating universities; each has a provisional admission policy for students who wish to register for summer

work only. The admission and registration forms can be submitted at the same time.

Early registration is advisable. Students are urged to submit applications before May 1 for the following summer session.

Courses

Permission of the instructor is required for all courses. Enrollment is limited to eight students in most courses. Classes meet all day, five days a week. Courses vary from year to year (see annual Iowa Lakeside Laboratory bulletin); the following are representative.

L:101 Field Natural History **5 s.h.**
Biological diversity and its causes examined through lectures and field trips to native lake, marsh, forest, and prairie habitats; topics include measuring the environment, sampling and identifying organisms, experimenting with the ecosystem, understanding species interactions, and appreciating influences of past and present climates and geological events on natural ecosystems of the region. Prerequisite: one course in biology.

L:102 Field Botany **5 s.h.**
Introduction to the natural history of local plants; emphasis on ecology distribution, dispersal, pollination, breeding systems, and plant-herbivore interactions; field and laboratory work, reading, discussion. Prerequisite: one course in biology.

L:103 Aquatic Ecology **5 s.h.**
Local aquatic plants and animals, analysis of ecosystems; emphasis on basic ecological principles; field work and methods are meshed with theory, but the course is not technical limnology. Prerequisite: broad biological background including ecology, chemistry, and physics.

L:104 Aquatic Ecology Projects **5 s.h.**
Individual project work.

L:105 Plant Taxonomy **5 s.h.**
Basic principles of classification and evolution of vascular plants; taxonomic tools, techniques, and native flora; emphasis on field collections and group projects.

L:107 Field Parasitology **5 s.h.**
Ecology and life history of parasites, protozoans, helminths, and arthropods; field and laboratory investigations including preparation, identification, and morphology of representative types and stages; general and comparative concepts of parasitology.

L:108 Ecology of Prehistoric Iowans **5 s.h.**
Where prehistoric Iowans lived and what they ate; laboratory examination of plant and animal materials excavated from campsites. Prerequisite: one or more courses in anthropology, botany, or zoology.

L:111 Research **arr.**

L:112 Research **arr.**

L:113 Independent Study **arr.**

L:114 Independent Study **arr.**

L:115 Field Mycology **5 s.h.**
Identification and classification of the common fungi; techniques for identification, preservation, and culture practiced with members of the various fungi groups.

L:117 Ecology and Systematics of Diatoms **5 s.h.**
Field and laboratory experience in the study of freshwater diatoms to gain familiarity with most of the genera and some of the species: techniques in collection, preparation, and identification of diatom samples; study of environmental factors affecting growth, distribution, taxonomy; project design and execution. Microscopes available, but students with high-quality oil immersion lens binocular microscopes are encouraged to bring them.

L:118 Quaternary Studies **5 s.h.**
Landforms and biotic history of a classical glacial region of Iowa; includes field work and laboratory on landform derivation and history of life based on pollen and other remains; extended field trip.

L:119 Field Biology of Bryophytes and Pteridophytes **5 s.h.**
Field and laboratory investigation of mosses, liverworts, clubmosses, spikemosses, quillworts, horsetails, and ferns; field work deals with collection and identification of species and analysis of their habitats.

L:120 Developmental Biology of Freshwater Invertebrates **5 s.h.**
Basic developmental biology: spawning, cleavage, cell lineages, torsions, appendage specialization, hormonal control, regeneration, colonies, grafting; varied habitats allow comparative approach with many species; field collections, culturing, analytical and experimental procedures, written and oral reports.

L:122 Prairie Ecology **5 s.h.**
Study of the basic patterns and underlying physical and biotic causes of both regional and local distributions of plants and animals of North American prairies; field and laboratory analyses and projects. Prerequisite: familiarity with basic principles in biology and ecology.

L:125 Neurobiology **5 s.h.**
Behavior, comparisons, integration of systems, cellular levels of nervous systems; laboratory and field work; opportunity to work on many animals; extensive laboratory work.

L:126 Field Ornithology **5 s.h.**
Field study of biology of birds; focus on ecology and behavior; techniques; population studies such as census taking, banding, nesting, and behavior.

L:127 Field Entomology **5 s.h.**
Field and laboratory study of insects, their diversity, and life history; emphasis on ecology and behavior. Prerequisite: some biological background.

L:128 Fish Ecology **5 s.h.**
Basic principles of fish interaction with the biotic and abiotic elements of the environment; field work, methods, and theory meshed to provide background in taxonomy and the biology of freshwater fish; emphasis on the fish fauna of northwestern Iowa lakes and streams.

L:129 Field Vertebrate Zoology **5 s.h.**
Field and laboratory investigation of representative vertebrates and their major structural, functional, and behavioral characteristics; characteristics in terms of ecology and systematics; observations on live animals are central to projects.

L:130 Field Mammalogy **5 s.h.**
Behavior, reproductive biology, habitat preference, and structure of local mammal populations; local prairie populations compared to those of adjacent agricultural lands and woods. Prerequisites: basic courses in zoology (biology) and ecology.

ITALIAN

See "French and Italian."

JOURNALISM AND MASS COMMUNICATION

Director: Kenneth Starck
Associate director: Carolyn Stewart Dyer
Professors: Joseph Ascroft, Hanno Hardt, Donald Smith, Kenneth Starck, Albert Talbott
Professor emeritus: Leslie G. Moeller
Associate professors: Kay Amert, Carolyn Stewart Dyer, John Erickson, Jeffery Smith, John Soloski, William Zima
Assistant professors: John Bennett, Daniel Berkowitz, Sue Lafky, Judy Polumbaum
Adjunct professors: Gilbert Cranberg, Daniel Lind
Instructors: Kathryn Cirksena, Richard Johns
Undergraduate degrees offered: B.A., B.S. in Journalism and Mass Communication
Graduate degrees offered: M.A. in Journalism; Ph.D. in Mass Communications

Undergraduate Program

The Iowa undergraduate program prepares students for careers in journalism and mass communication by providing them professional training as part of a strong liberal arts education. The program integrates the development of professional skills with theoretical consideration of the role of the media in society.

Majors prepare for careers as journalists for newspapers, magazines, radio, and television and in a variety of areas such as public relations, publication design, photojournalism, cable television, and media research.

The undergraduate program builds on the University's commitment to a liberal arts education. Majors are required to take both professional and academic courses in the school and must complete extensive academic work outside of the school. Students earn the B.A. or B.S. degree.

The school is accredited by the Accrediting Council on Education in Journalism and Mass Communication.

Selective Admissions

To preserve the quality of its programs, the School of Journalism and Mass Communication has a selective admissions program. Thus, students with declared interest in journalism are classified as prejournalism majors until they are admitted to major status. Before applying for admission to the program as majors, students must take two premajor courses, 19:90 Social Scientific Foundations of Communication and 19:91 Cultural and Historical Foundations of Communication, and complete all required rhetoric courses. Students may apply for admission to major status during the semester in which they will have completed these requirements and at least 60 semester hours. Students in the College of Liberal Arts Honors Program may apply for admission to major status in the semester during which they will complete the premajor requirements and 45 semester hours. Applications and deadline information are available in the School of Journalism and Mass Communication office.

The primary criterion for admission to major status is overall academic performance. Other factors considered are performance in the required premajor courses and other journalism courses, a statement of interest submitted by the student, and writing ability. The number of students accepted each semester depends on the number of students already in the program and available resources. Since the selective admission policy was instituted, all qualified applicants with overall and journalism grade-point averages above 3.00 have been admitted. The applications of other students have been reviewed in light of the goal of admitting the most qualified students to the program.

Curriculum

Majors must complete a minimum of 30 and a maximum of 34 semester hours of journalism courses with a grade of C- or better in each course and 24 semester hours in a second area of concentration. All majors must complete 19:115 Journalistic Reporting and Writing and one advanced reporting and writing course (19:120-19:125). Students also must complete either an additional advanced reporting and writing course or a media workshop (19:130-19:137). Every major must complete 19:149 Legal and Ethical Issues in Communication and one advanced conceptual course numbered 19:150 or above. Majors take additional electives to develop professional and conceptual interests.

Because of the flexibility inherent in the undergraduate program, a new major should develop an individual plan of study in consultation with a faculty adviser.

Required Courses

Minimum of 30 semester hours; maximum of 34 semester hours

Premajor Foundation

19:90 Social Scientific Foundations of Communication	3 s.h.
19:91 Cultural and Historical Foundations of Communication	3 s.h.

Journalism Laboratory

19:115 Journalistic Reporting and Writing	4 s.h.
One advanced reporting and writing course (19:120-19:125)	4 s.h.
A second advanced reporting and writing course (19:120-19:125)	4 s.h.
or	
One media workshop (19:130-19:137)	

Conceptual

19:149 Legal and Ethical Issues in Communication	3 s.h.
A conceptual course numbered 19:150 or higher	3 s.h.

Electives

Drawn from undergraduate courses	6 s.h.

Additional Electives

Students have the option of taking an additional 3- or 4-semester hour course, for the maximum 34 semester hours.

Second Area of Concentration

In addition to completing the College of Liberal Arts General Education Requirements, every journalism major must complete a second area of concentration outside of journalism and mass communication. Study in the second area permits students to acquire a substantial body of knowledge, learn how another discipline views the world, or develop a companion set of skills to those in journalism and mass communication.

This concentration requirement may be fulfilled by completing a second major or by choosing 24 semester hours of related courses in one or more departments. Students who do not complete second majors must complete at least 15 of the 24 required semester hours in upper level courses. Course work in the second area must be arranged in consultation with an adviser; each student must have his or her adviser's written approval of the second area before graduation.

Bachelor of Arts

A student seeking a B.A. in journalism and mass communication must complete the journalism major requirements (30 semester hours), and must fulfill the school's second area of concentration requirement in one of two ways:

- Obtain a full B.A. major in another department; or
- Complete a 24-semester-hour concentration of related courses in one or more departments that offer B.A. degrees; this work must include 15 or more semester hours of work in upper-level courses and should be designed by the student in consultation with an adviser; the adviser must certify the completion of the second area of concentration before the student may graduate.

Bachelor of Science

A student seeking a B.S. in journalism and mass communication must complete the journalism major requirements (30 semester hours), and must fulfill the school's second area of concentration requirement in one of two ways:

- Complete a B.S. major in a natural, mathematical, or social science; or
- Complete the following:

  A 24-semester-hour concentration of related courses in the social sciences (economics, geography, political science, psychology, or sociology) and/or the natural and mathematical sciences; at least 15 hours of this second-area work must be in upper-level courses and should be designed by the student in consultation with an adviser; the student must have written approval of the second area of concentration by a journalism adviser in order to graduate; and

  All the special math, research methods, statistics, computer science, and/or cognate science requirements necessary for the B.S. degree in the department in which the majority of second-area work is done.

Honors

Majors with outstanding academic records may participate in the College of Liberal Arts Honors Program and earn the honors degree in journalism and mass communication. The program provides students with an opportunity to complete individual work under the guidance of a faculty member.

A major with an overall grade-point average of 3.20 or higher may write an application letter to the school's head of undergraduate studies requesting admission to the honors program in the School of Journalism and Mass Communication. The letter should review possible areas of interest and topics the student might pursue in completing an honors project. The student then consults with the head of undergraduate studies to identify a faculty member with whom he or she will develop an honors project. The student may arrange honors readings with a particular faculty member or take existing courses in the area of interest.

Honors projects may be completed in the form of a thesis or a professional project. The student must develop the form and topic of the project in a written proposal, which must be accepted by a faculty member. Once the proposal is accepted, the student enrolls in 19:191 Honors Project under the faculty member's section number. Students become official honors candidates in the school once they enroll in this course.

The honors candidate must make a formal presentation of the project to a committee consisting of the faculty adviser, as chair, and two other faculty members selected by the student in consultation with the adviser. At least two committee members must accept the completed project before the student can receive an honors degree in journalism and mass communication.

The school's maximum limit of 34 semester hours of journalism courses may be waived for students who complete honors degrees in journalism, on the recommendation of the honors adviser.

Minor

To meet the requirements for a minor in journalism and mass communication, students must complete at least 15 semester hours in journalism and mass communication with a grade-point average of 2.00; 12 of the 15 semester hours must be courses numbered 100 or higher. One of the following courses is strongly recommended:

19:90 Social Scientific Foundations of Communication	3 s.h.
or	
19:91 Cultural and Historical Foundations of Communication	3 s.h.

The minor is not intended to be sufficient professional preparation for a career in journalism or mass communication. The minor should be regarded as an introduction to the field.

Courses for the minor may not be taken pass/nonpass. When students apply for a degree, they must inform the Office of the Registrar that they want to have a minor listed on their transcripts.

Transfer Students

All transfer students with a declared interest in journalism are classified as premajors. They may apply for major status during the semester in which they will have completed at least 60 semester hours (including those from The University of Iowa and other institutions) and their rhetoric requirements, 19:90 Social Scientific Foundations of Communication, and 19:91 Cultural and Historical Foundations of Communication. Neither of these premajor course requirements may be waived on the basis of work taken at other institutions; thus, a transfer student will be a premajor for at least one semester.

The school's policy is to accept journalism transfer credits from other institutions for up to, but not more than, 20 percent (6-7 semester hours) of the student's total number of semester hours toward a major in journalism and mass communication at Iowa. Some journalism course work taken elsewhere might be applicable toward fulfilling elective and/or second area of concentration requirements. Any transfer credit intended to meet School of Journalism and Mass Communication requirements must be approved by the head of undergraduate studies.

Graduate Programs

Master of Arts

The School of Journalism and Mass Communication offers a Master of Arts program with three separate emphases: professional journalism, communication and mass communication, and development support communication. Applicants should indicate the emphasis for which they seek admission.

Each emphasis requires 30 semester hours of approved course work, the completion of a master's project or thesis, and the successful completion of the final examination. The specific requirements of each emphasis are listed below.

Professional Program in Journalism

This program is for individuals who wish to improve their technical and analytical skills and to broaden their understanding of the role and function of mass communication in contemporary society, but who do not plan to engage in Ph.D. work.

It serves the student who has a background in a field other than journalism and has just completed an undergraduate degree in another field or has worked in a career unrelated to journalism (see "Group 1 Requirements," below). It also serves the student who has worked in some area of mass communication (see "Group 2 Requirements" below).

The program is not designed or intended for individuals who have just completed undergraduate programs in journalism and have no subsequent work experience in mass communication.

Group 1 Requirements

19:115 Journalistic Reporting and Writing (does not count toward degree)	(4 s.h.)
19:220 Master's Seminar	3 s.h.
Two advanced reporting and writing courses (19:230-19:239)	6 s.h.
A third advanced reporting and writing course	3 s.h.
or	
One media workshop (19:240-19:249)	
Electives	15 s.h.
19:299 Master's Research (project)	3 s.h.

Electives require consent of the adviser and may be selected from either School of Journalism and Mass Communication courses or from courses offered by other departments.

Group 2 Requirements

19:220 Master's Seminar	3 s.h.
19:299 Master's Research (thesis)	3 s.h.
Journalism and Mass Communication electives	9 s.h.
Other electives	15 s.h.

Electives require consent of the adviser. The 15 semester hours of "other electives" may be selected from either School of Journalism and Mass Communication courses or from courses offered by other departments.

Every student in the professional program must complete a professional project (19:299) under the supervision of a graduate faculty member and take a final examination during the last semester of enrollment.

There is considerable flexibility within the professional journalism program. The model programs are intended as general information for new and prospective students. The actual program of study for any student is planned in close consultation with the adviser.

Mass Communication and Communication Emphasis

This emphasis offers a specialization in the study of communication phenomena with special emphasis on theory and methodology. Qualified individuals may petition the graduate admissions committee of the School of Journalism and Mass Communication for admission to the Ph.D. program after successful completion of their M.A. work. The following courses are required:

19:220 Master's Seminar (two semesters)	2 s.h.
19:221 Approaches to the Study of Communication: Issues and Concepts	3 s.h.
One of the following methods courses:	3 s.h.
19:260 Communication Research: Historical Approaches	
19:261 Communication Research: Behavioral Approaches	
19:262 Communication Research: Phenomenological Approaches	
19:263 Communication Research: Legal Issues Approaches	
Electives in journalism and mass communication and in other departments	19 s.h.
19:299 Master's Research (thesis)	3 s.h.

Every student in the mass communication and communication emphasis must complete an M.A. thesis (19:299) under the supervision of a graduate faculty member and take a final examination during the last semester of enrollment.

All students are expected to take course work outside the School of Journalism and Mass Communication; the nature and extent of the work is determined by the student and the faculty adviser.

Development Support Communication Emphasis

This multidisciplinary emphasis involves the cooperation of the Departments of Geography and Political Science. It is intended for students seeking to gain analytical and technical expertise and an understanding of the role and function of mass communication in the process of helping solve Third World development problems. The emphasis offers both thesis and nonthesis tracks.

Information about the specific requirements of the development support communication emphasis are available from the School of Journalism and Mass Communication.

Doctor of Philosophy

The Ph.D. program emphasizes interdisciplinary inquiry into mass communication phenomena within cultural and historical perspectives. Approaches include philosophical, evaluative, and critical inquiry. The program's substantive nature is defined by the scholarly interests of its faculty, who turn most frequently to investigations of historical, legal, economic, social, and cross-cultural aspects of communication, both verbal and visual.

The Ph.D. program is highly individualized. Drawing on the School of Journalism and Mass Communication as well as other academic units, each student develops a specific course of study that reflects his or her academic background, experience, professional goals, and intellectual preferences. Applicants should be interested in the opportunity to join a small group of students working to understand mass communication in its cultural contexts. A more complete description of the graduate program is available from the School of Journalism and Mass Communication. Students should ask for the *Graduate Studies Handbook*.

Facilities

The School of Journalism and Mass Communication is housed in the three-story Communications Center. The school has special laboratories for photography, typography, audio, video, electronic newswriting, and desktop publishing. Many students use the newsroom and other facilities of the University's award-winning student newspaper, *The Daily Iowan*, which is housed in the Communications Center. Special facilities in the building include the Leslie G. Moeller Seminar Room and the Merritt Speidel Presentation Room.

The school has its own resource center and provides accommodations for offices of the Iowa High School Press Association and the Quill and Scroll Society. A display gallery is available for student and faculty photography and other projects.

Iowa Center for Communication Study

The center encourages and facilitates student and faculty research in the field of communication. Among its publications are *The Journal of Communication Inquiry*, edited by graduate students, and *The Iowa Guide: Scholarly Journals in Mass Communication and Related Fields.*

Financial Aid

Nearly $40,000 in scholarships is available to undergraduate and graduate journalism majors each year. Information and applications for journalism scholarships are available from the school each fall. Research and teaching assistantships are available for graduate students, with preference given to doctoral students. The school also has a program of modest financial support for student research projects.

Professional Enrichment

The school encourages students to participate in learning opportunities outside the classroom. Internships in journalism and public relations positions are available to students through The University of Iowa Cooperative Education Program. These experiences are selected and monitored to contribute to students' professional growth. The School of Journalism and Mass Communication does not award academic credit for internships. In addition to internships, student-operated media—including *The Daily Iowan*, KRUI-FM radio, and *The Hawkeye* yearbook—provide opportunities for journalism experience.

Job Placement

The school posts notices of professional jobs open to journalism students and graduates. The University's Career Information Services and the Business and Liberal Arts Placement Office provide career guidance and placement services as well as workshops and programs on job-seeking skills.

Special Activities

The school engages in a variety of activities for the enrichment of students, faculty, and the entire campus. Many speakers visit campus each year as part of John F. Murray Lectureships and the Leslie G. Moeller Lectureship Series. Campus organizations for students include Kappa Tau Alpha, National Association of Black Journalists (NABJ), Public Relations Student Society of America (PRSSA), and the Society of Professional Journalists (SPJ).

Semester in London

Each spring semester, advanced undergraduates and M.A. professional students have an opportunity to study in England through the London Semester Program. A dozen students take courses, including some offered in conjunction with the City University of London. Courses of both practical and theoretical nature are offered, with courses in specialty reporting and the history of the British media offered by the City University. Internships may be arranged with London media.

Courses

Primarily for Undergraduates

All courses listed as 100-level or higher require at least junior standing or major status and/or consent of instructor.

19:000 Journalism and Mass Communication Cooperative Education Internship **0 s.h.**
Internships administered by cooperative education and filled on a competitive basis. Consent of journalism graduate adviser required for graduate students. Prerequisite: 12 semester hours of journalism and mass communication courses and any specifically required courses.

19:35 Introduction to Broadcasting and Film Production **3 s.h.**
Project-oriented, with short video production, two short super-8 films, and two audio productions required; emphasis on formulative principles and effectiveness of communication; equipment and training provided; for students with no previous experience. Same as 36B:35.

19:90 Social Scientific Foundations of Communication **3 s.h.**
Purposes and processes of communication within and between social systems; social scientific foundation for the study and practice of communication and mass communication. GER: social sciences.

19:91 Cultural and Historical Foundations of Communication **3 s.h.**
Historical development of the communication process; emphasizes individual, group, societal, and cross-cultural role of communication and mass communication.

19:95 Media and Consumers **3 s.h.**
Communications media in historical, political, and economic contexts and their relationships with audiences; criteria for evaluating media content relative to the nature and consequences of news, entertainment, and advertising.

19:101 Methods: Secondary School Journalism **3 s.h.**
Methods and materials for teaching high school journalism; publication policies, staff organization, production schedules, and techniques for advising student publications. Offered fall semesters. Same as 7S:113.

19:102 Workshop for Secondary School Journalism/Communication Teachers **1-2 s.h.**
Journalism/mass media curriculum, audio/video production, photojournalism, publication design, journalistic writing techniques, and advising student publications. Same as 7S:130.

19:115 Journalistic Reporting and Writing **4 s.h.**
Fundamentals of journalistic reporting and writing; progression from basic assignments to more complex and sophisticated news writing; emphasis on reporting techniques and beat coverage. Consent of instructor required.

19:120 Specialized Reporting and Writing **4 s.h.**
Advanced reporting and writing; taught in sections; topics vary and may include public affairs, law, science, business, medicine, intercultural affairs, education. Consent of instructor required. Prerequisite: 19:115.

19:121 Depth Reporting and Writing **4 s.h.**
Enterprise reporting; emphasis on reporter as researcher, organizer, and writer of complex stories in a variety of contexts. Consent of instructor required. Prerequisite: 19:115.

19:122 Magazine Reporting and Writing **4 s.h.**
Finding ideas, researching, interviewing; problems of organization and style; identification of audiences and markets. Consent of instructor required. Prerequisite: 19:115.

19:123 Broadcast Journalism Reporting and Writing **4 s.h.**
Introduction to principles of broadcast journalism; gathering, writing, and editing information for broadcasting; emphasis on interview process. Consent of instructor required. Prerequisite: 19:115.

19:124 Public Relations Reporting and Writing **4 s.h.**
Introduction to public relations forms and style; includes writing for variety of audiences and purposes. Consent of instructor required. Prerequisite: 19:115.

19:125 Freelance Reporting and Writing **4 s.h.**
Approaches to writing and marketing free-lance articles to magazines, newspapers, and other publications; developing ideas, researching periodical markets, writing queries, writing and rewriting articles for publication. Consent of instructor required. Prerequisite: 19:115.

19:130 Media Workshop **4 s.h.**
Analysis and solution of problems with communication strategies and/or media products; topics such as public relations, newsletter production, and media research. Consent of instructor required. Prerequisite: 19:115.

19:131 Publication Design Workshop **4 s.h.**
Problems of design and layout for publications: tools, techniques, and functional and aesthetic considerations; creative design projects. Consent of instructor required. Prerequisite: 19:115.

19:132 Photojournalism Workshop **4 s.h.**
Techniques of photojournalism; basic craft, location shooting, editing photographs, combining words and images for variety of purposes; group critiques of assignments. Consent of instructor required. Prerequisite: 19:115.

19:133 Typography Workshop **4 s.h.**
Typography and typographic design: letterform terminology, differentiation, and use in design; laboratory work and creative projects. Consent of instructor required. Prerequisite: 19:115.

19:134 Broadcast Journalism Workshop **4 s.h.**
Introduction to electronic news gathering (ENG); conceptualization, shooting, and editing basic news packages. Consent of instructor required. Prerequisite: 19:115.

19:135 Public Relations Practice Workshop **4 s.h.**
Development and presentation of public relations campaigns for client organizations; application of communication theory and research technique to analysis and solution of public relations problems in organizational and cultural environments. Consent of instructor required. Prerequisite: 19:115.

19:136 Editing Workshop 4 s.h.
Theory, principles, and process in editing and packaging material for various forms of publication; stresses basics of editing—copy editing, headlining, illustrating, and laying out material; pencil and computer editing; desktop publishing. Consent of instructor required. Prerequisite: 19:115.

19:137 Book Design Workshop 4 s.h.
Specialized practices and problems of book design; computerized typesetting and layout technology; workshop format. Consent of instructor required. Prerequisite: 19:115.

19:149 Legal and Ethical Issues in Communication 3 s.h.
Introduction to legal and ethical issues affecting the media: freedom of expression, libel, privacy, access to information, protection of news sources, free press-fair trial, copyright, and government regulation of broadcasting. Prerequisite: junior standing.

19:150 Visual Communication 3 s.h.
History of twentieth-century visual communication from a cultural perspective; development of visual form, composition, spatial representation, and color; in-depth discussion of the work of selected artists, designers, and photographers.

19:151 Communication Research Methods 3 s.h.
Fundamentals of scientific inquiry in the study of communication and mass communication behavior; language, concepts, procedures, and application of behavioral research methods, including both field and experimental approaches. Prerequisite: 19:90 or 19:91 or consent of instructor.

19:152 History of Mass Communication in the United States 3 s.h.
Development of mass communication in context of U.S. history; selected topics. Prerequisite: 19:91 or consent of instructor.

19:153 Popular Culture and Mass Communication 3 s.h.
Relationships between popular media fare and cultural realities; media formulas and communication practices in American culture.

19:154 Economic and Technological Issues in Media 3 s.h.
Economic condition of American mass media; relationship between technology and economics, impact on media content; current issues in U.S. communication policy; newspapers, television, radio, cable television, and telecommunications.

19:155 Mass Media and Society 3 s.h.
Audience characteristics of mass media, effects of mass media on these audiences; relationship of mass media to public opinion, crime and violence, political affairs, racism, and sexism. Prerequisite: 19:90 or 19:91 or consent of instructor.

19:156 Comparative Communication Systems 3 s.h.
Capitalist, socialist, and Third World media principles and practices; problems of communication, media, and international relations; emphasis on contemporary affairs.

19:157 Third World Development Support 3 s.h.
Patterns and processes of Third World development; implications of regional growth and spatial diffusion; critical analysis of communication strategies in support of development projects. GER: foreign civilization and culture. Consent of instructor required. Same as 44:157.

19:158 News-Editorial Problems 2-3 s.h.
Duties and responsibilities of mass media in contemporary society; topics vary.

19:159 Electoral Politics and the Mass Media 3 s.h.
Symbiotic relationships between political campaigns and mass media, roles of media campaign coverage, issue versus image orientations of campaign coverage and advertising, and how these affect citizen perceptions and decision making.

19:161 Law and the American Media 3 s.h.
First Amendment theory and selected topics in current communication law. Prerequisite: 19:149 or consent of instructor.

19:162 Communication and Public Relations 3 s.h.
Analysis of public relations problems in organizational systems; emphasis on communication theory and research in development of conceptual and operational perspectives.

19:163 History of Books and Printing 3 s.h.
Invention and spread of printing technology, social and cultural impact of printing in the West; focus on books and other forms of printed media.

19:164 Images and Society 3 s.h.
Cultural history of images in twentieth-century society, concentrating on social production and uses of photography, film, and television.

19:180 Special Projects in Mass Communication arr.
Research and extended readings to fit needs and interests of students. May be repeated for up to 8 s.h. Consent of instructor required.

19:181 Readings in Communication and Mass Communication 1-3 s.h.
Reading and discussion focusing on a problem or issue. May be repeated. Consent of instructor required.

19:190 Honors Readings 1-3 s.h.
Intensive reading on student-selected topic pertaining to journalism or mass communication; may include periodic discussions with supervising faculty member and final paper. Open only to honors students. Consent of instructor required.

19:191 Honors Project 3 s.h.
Independent research for candidates completing honors project; planned in consultation with sponsoring faculty member. Consent of instructor required.

Primarily for Undergraduates

19:200 Visual Communication 3 s.h.
History of twentieth-century visual communication from cultural perspective; development of visual form, composition, spatial representation, and color; in-depth discussion of work of selected artists, designers, and photographers.

19:201 Communication Research Methods 3 s.h.
Fundamentals of scientific inquiry in study of communication and mass communication behavior; emphasis on learning the language, concepts, procedures, and application of behavioral research methods, including both field and experimental approaches.

19:202 History of Mass Communication in the United States 3 s.h.
Development of mass communication in context of U.S. history; selected topics. Prerequisite: 19:91 or consent of instructor.

19:203 Popular Culture and Mass Communication 3 s.h.
Relationships between popular media fare and cultural realities; media formulas and communication practices in American culture.

19:204 Economic and Technological Issues in Media 3 s.h.
Economic condition of American mass media; relationship between technology and economics, impact on media content; current issues in U.S. communication policy; newspapers, radio, television, cable television, and telecommunications.

19:205 Mass Media and Society 3 s.h.
Audience characteristics of mass media, effects of mass media on audiences; relationship to public opinion, crime and violence, political affairs, racism, and sexism.

19:206 Comparative Communication Systems 3 s.h.
Capitalist, socialist, and Third World media principles and practices; problems of communication, media, and international relations; emphasis on contemporary affairs.

19:207 Third World Development Support 3 s.h.
Patterns and processes of Third World development; implications of regional growth and spatial diffusion; critical analysis of communication strategies in support of development projects.

19:208 News-Editorial Problems 2-3 s.h.
Duties and responsibilities of mass media in contemporary society; topics vary.

19:209 Electoral Politics and the Mass Media 3 s.h.
Symbiotic relationships between political campaigns and mass media, roles of media campaign coverage; issue versus image orientations of campaign coverage and advertising, and how these affect citizen perceptions and decision making.

19:211 Law and the American Media 3 s.h.
First Amendment theory and selected topics in communication law.

19:213 History of Books and Printing 3 s.h.
Invention and spread of printing technology, social and cultural impact of printing in the West; focus on books and other forms of printed media.

19:214 Images and Society 3 s.h.
Cultural history of images in twentieth-century society, concentrating on social production and uses of photography, film, and television.

19:220 Master's Seminar 1-3 s.h.
Separate sections for students in M.A. professional, thesis, and development support communication programs; professional students investigate journalism as a mode of inquiry, conceptual approaches, professional and institutional problems; thesis program section meets with Ph.D. seminar 19:320.

19:221 Approaches to the Study of Communication: Issues and Concepts 3 s.h.
Introduction to major communication and mass communication concepts; their use and development.

19:230 Specialized Reporting and Writing 3 s.h.
Advanced reporting and writing; taught in sections; topics vary and may include public affairs, law, science, business, medicine, intercultural affairs, education. Consent of instructor required. Prerequisite: 19:115.

19:231 Depth Reporting and Writing 3 s.h.
Enterprise reporting; emphasis on reporter as researcher, organizer, and writer of complex stories in a variety of contexts. Consent of instructor required. Prerequisite: 19:115.

19:232 Magazine Reporting and Writing 3 s.h.
Finding ideas, researching, interviewing; problems of organization and style; identification of audiences and markets. Consent of instructor required. Prerequisite: 19:115.

19:233 Broadcast Journalism Reporting and Writing 3 s.h.
Introduction to principles of broadcast journalism; gathering, writing, and editing information for broadcasting; emphasis on interview process. Consent of instructor required. Prerequisite: 19:115.

19:234 Public Relations Reporting and Writing 3 s.h.
Introduction to public relations forms and style; writing for variety of audiences and purposes. Consent of instructor required. Prerequisite: 19:115.

19:235 Freelance Reporting and Writing 3 s.h.
Approaches to writing and marketing free-lance articles to magazines, newspapers, and other publications; developing ideas, researching periodical markets, writing queries, writing and rewriting articles for publication. Consent of instructor required. Prerequisite: 19:115.

19:240 Media Workshop 3 s.h.
Analysis and solution of problems with communication strategies and/or media products; topics such as public relations, newsletter production, media research. Consent of instructor required. Prerequisite: 19:115.

19:241 Publication Design Workshop 3 s.h.
Problems of design and layout for publications: tools, techniques, and functional and aesthetic considerations; creative design projects. Consent of instructor required. Prerequisite: 19:115.

19:242 Photojournalism Workshop 3 s.h.
Techniques of photojournalism; basic craft, location shooting, editing photographs, combining words and images for variety of purposes; group critiques of assignments. Consent of instructor required. Prerequisite: 19:115.

19:243 Typography Workshop 3 s.h.
Typography and typographic design: letterform terminology, differentiation, use in design; laboratory work and creative projects. Consent of instructor required. Prerequisite: 19:115.

19:244 Broadcast Journalism Workshop 3 s.h.
Introduction to electronic news gathering (ENG); conceptualization, shooting, and editing basic news packages. Consent of instructor required. Prerequisite: 19:115.

19:245 Public Relations Practice Workshop 3 s.h.
Development and presentation of public relations campaigns for client organizations; application of communication theory and research technique to analysis and solution of public relations problems in organizational and cultural environments. Consent of instructor required. Prerequisite: 19:115.

19:246 Editing Workshop 3 s.h.
Theory, principles, and process in editing and packaging material for various forms of publication; stresses basics of editing—copy editing, headlining, illustrating, and laying out material; pencil and computer editing; desktop publishing. Consent of instructor required. Prerequisite: 19:115.

19:247 Book Design Workshop 3 s.h.
Specialized practices and problems of book design; computerized typesetting and layout technology; workshop format. Consent of instructor required. Prerequisite: 19:115.

19:250 Seminar in Visual Communication 3 s.h.
Conceptual and theoretical approaches for analyzing photographic media in relation to research on historical and cultural aspects of visual communication. Consent of instructor required.

19:251 History of the Book 3 s.h.
Technological, social, and cultural dimensions explored through close reading of major texts in the field. Same as 8:203, 21:223.

19:252 Social Meanings of News 3 s.h.
How the concept of news has been studied in social and historical research.

19:253 Economics, Technology, and American Mass Media 3 s.h.
Economic condition of the American mass media; role in society; focus on how economics and technology affect that role; newspapers, radio, television, cable television, and telecommunications.

19:254 Communication and Change 3 s.h.
Theory, research, and methodological problems of studying change; diffusion of innovations, media and change, reform organizations, revolutionary and evolutionary organizations.

19:255 Problems in International Communication 3 s.h.
Topics vary and may include communication systems in national development; international and cross-cultural communication structure and theory; images and values; mass persuasion; laws and agreements; information channels, content, flow, and effects; censorship, language, and literacy.

19:256 Gender and Mass Communication 3 s.h.
Feminist analysis of gender and language; images of women in media; employment of women and minorities by media; media created for women and men; affirmative action in broadcast regulation; selected topics.

19:257 Communication and Social Theory 3 s.h.
Social theorists who emphasize communication processes in their analyses of social interaction and society.

19:258 Mass Communications in Modern Society 2-4 s.h.
Concept of mass communications; rights and responsibilities of parties involved; public opinion; interaction of mass media and society; government, politics, world affairs, and mass communications; mass media as institutions and as systems; mass media and social change.

19:259 Theory of Popular Culture 3 s.h.
Major theoretical approaches to the study of popular culture; examination of representative studies.

19:260 Communication Research: Historical Approaches 3 s.h.
Historical methods in communication research and historiography; designed to prepare students for research in communication history.

19:261 Communication Research: Behavioral Approaches 3 s.h.
Introduction to communication inquiry using behavioral science research methodology; selected analytic tools, approaches, models, and methods reviewed through readings, lectures, demonstrations, and worked examples.

19:262 Communication Research: Phenomenological Approaches 3 s.h.
How people construct and carry out communication; symbolic interactionism, ethnography, ethnomethodology; participant observation, ethnographic interviewing, and field observation as methods for studying how people interpret and construct their worlds.

19:263 Communication Research: Legal Issues Approaches 3 s.h.
Introduction to legal research methods and materials for studying communications law. Open to undergraduates with consent of instructor.

19:270 History of Mass Communication 3 s.h.
Readings and research on various problems in history of mass communication; topics vary.

19:271 Mass Communication Law 3 s.h.
Readings and research on problems in mass communication law; topics vary.

19:280 Master's Tutorial arr.
Directed readings in special topics in communication and mass communication inquiry. Consent of instructor required.

19:281 Master's Practicum arr.
Research, extended readings, and projects to fit special needs and interests of students. Consent of instructor required.

19:299 Master's Research arr.
Independent research for master's candidates working on projects and theses. Written consent of sponsoring faculty member, director of graduate studies, and instructor required.

19:320 Ph.D. Seminar 1 s.h.
Substantive theoretical or methodological problems in mass communication; forum.

19:325 Multivariate Communication Theory and Research 3 s.h.
Philosophy, theory, and methods in multivariate study of communication and mass communication behavior; special emphasis on clustering and pattern analytic devices: Stephenson's Q methods, factor analysis, McQuitty's pattern analysis, and scaling.

19:330 Literature of Communication arr.
Review and discussion of significant works in communication and mass communication theory; topics vary.

19:340 Seminar in Organizational Communication Theory 3 s.h.
Major theoretical approaches to study of organizing and organization; focuses on communication as the basic process in human ordering, planning, and acting. Same as 36:635.

19:341 Mass Communication and Cultural Theory 3 s.h.
Basic theoretical approaches to mass communication; emphasis on the role of cultural traditions in shaping mass media; attention to contemporary British and continental scholarship.

19:342 Mass Communication and Society 2-4 s.h.
Political, economic, and social factors that influence content and character of mass media; ethics, rights, and responsibilities of mass communication media; place of mass media in social change and social planning.

19:343 International Communication arr.
International and cross-cultural communication; selected topics.

19:380 Ph.D. Tutorial arr.
Communication and mass communication inquiry; selected topics. Consent of instructor required.

19:381 Ph.D. Research Practicum arr.
Conceptualization and execution of research projects. Consent of instructor required.

19:399 Dissertation arr.

LATIN

See "Classics."

LATIN AMERICAN STUDIES PROGRAM

Chair: Charles Hale
Professors: Thomas Charlton (Anthropology), Nora England (Anthropology), Roslyn Frank (Spanish and Portuguese), Oscar Hahn (Spanish and Portuguese), Charles Hale (History), Peter Snow (Political Science)
Associate professors: Florence Babb (Anthropology/Women's Studies), Michael Chibnik (Anthropology), María Angelina Duarte (Spanish and Portuguese), Enrique Fernández-Barros (Spanish and Portuguese), Thomas Lewis (Spanish and Portuguese), Adriana Méndez Rodenas (Spanish and Portuguese), Douglas Midgett (Anthropology), Christopher Roy (Art and Art History), Mario Santizo (Spanish and Portuguese), Diana Vélez (Spanish and Portuguese), Irene Wherritt (Spanish and Portuguese)
Assistant professors: Nora González (Spanish and Portuguese), Kathleen Newman (Spanish and Portuguese)

Latin American studies is an interdisciplinary undergraduate program that focuses on the history, politics, social organization, economy, geography, art, and literature of Latin America. Students enrolled in the program may earn the Certificate in Latin American Studies, or they may declare a minor in Latin American Studies. All students plan their programs in close cooperation with the Latin American studies adviser.

Programs

Certificate

To gain both depth of knowledge about Latin America and breadth in a variety of disciplines that study the area, students seeking the Certificate in Latin American Studies must earn at least 27 semester hours of credit in courses selected from "Courses Approved for LASP Certificate" below, including at least 6 semester hours in each of at least three of the following departments: anthropology, geography, history, political science, and Spanish and Portuguese. LASP-approved courses that apply toward the student's major may also be applied toward the LASP certificate.

Courses concerned in part with Latin America occasionally may be used as electives to satisfy the requirements for the certificate. Students should consult the Latin American studies adviser.

Senior Seminar

Seniors enroll in Latin American Studies Seminar (35:176, 38:159, 44:169, or 113:132), a 3-semester-hour interdisciplinary course focused on problems that pertain specifically to Latin America. The seminar is usually taught by two faculty members from the participating departments.

Minor

To earn a minor in Latin American studies, students complete 15 semester hours in approved Latin American Studies Program (LASP) courses, with a minimum

grade-point average of 2.00. Twelve of the 15 semester hours must be in courses numbered above 100 taken at The University of Iowa. To preserve the interdisciplinary character of the Latin American studies minor, students majoring in any of the primary departments cannot count more than 6 semester hours from courses in their major department toward the minor.

Courses Approved for LASP Certificate

For full descriptions of each of the courses listed below, see the listings in the appropriate departmental sections of the *Catalog*.

Anthropology

113:115 Ethnology of South America 3 s.h.
113:116 Ethnology of Mesoamerica 3 s.h.
113:118 Social Anthropology of the Caribbean 3 s.h.
113:131 Latin American Economy and Society 3 s.h.
113:132 Latin American Studies Seminar 3 s.h.
113:163 Archaeology of Mesoamerica 3 s.h.

Art

1H:105 Art of Pre-Columbian America 3 s.h.

Geography

44:167 Patterns of Urbanization and Development in Latin America 3 s.h.

History

16:110 Topics in Latin American History 3 s.h.
16:111 Colonial Latin America 3 s.h.
16:112 Introduction to Modern Latin America 3 s.h.
16:113 The Mexican Revolution 3 s.h.

Political Science

30:144 Latin American Government 3 s.h.
30:145 Major States of Latin America 3 s.h.
30:163 Inter-American Relations 2-3 s.h.

Portuguese

38:105 Brazilian Literature I 3 s.h.
38:106 Brazilian Literature II 3 s.h.
38:114 Culture and Civilization of the Portuguese-Speaking World (taught in English) 3 s.h.
38:159 Latin American Studies Seminar 3 s.h.

Spanish

35:20 Contemporary Latin American Narrative (taught in English) 3 s.h.
35:131 Contemporary Spanish American Fiction 3 s.h.
35:132 Spanish American Poetry I 3 s.h.
35:133 Spanish American Drama 3 s.h.
35:134 Spanish American Short Story 3 s.h.
35:170 Literature of the Discovery and Conquest of Spanish America 3 s.h.
35:175 Cultural Identity in Caribbean Literature 3 s.h.
35:176 Latin American Studies Seminar 3 s.h.
35:179 Testimonial Literature in Latin America 3 s.h.

Courses

130:120 Contemporary Latin American News Colloquium **2 s.h.**
Contemporary Latin American affairs as reported in the Latin American, European, and U.S. press; emphasis on political and socioeconomic themes. Same as 35:136.

LEISURE STUDIES

See "Division of Physical Education."

PROGRAMS IN LETTERS

Director: Richard Lloyd-Jones

Programs in Letters was established in 1986 as an administrative unit to coordinate several notable activities in language and literature, including the International Writing Program, the Iowa Center for the Book, the Midwest Language Association, the Publications Consultant, the Translation Workshop, and the Windhover Press.

Center for the Book

The University of Iowa Center for the Book encourages and facilitates student and faculty research in the various disciplines associated with the book. Faculty and staff members affiliated with the center have appointments in the School of Art and Art History, University Libraries' conservation and special collections departments, the School of Journalism, and the English Department. They conduct scholarly and applied research and teach classes.

International Writing Program, Windhover Press

See "Iowa Center for the Arts" in the Special Resources at Iowa section of the *Catalog*.

Translation Workshop

See "Master of Fine Arts in Translation" under "Comparative Literature."

Courses

108:110 Introduction to Papermaking **2-3 s.h.**
Same as 1X:110.

108:120 Advanced Papermaking **3 s.h.**
Same as 1X:120.

108:130 Paperworks **3 s.h.**

108:131 Photocommunication I **3 s.h.**

108:132 Photocommunication II **3 s.h.**

108:134 Silkscreen **3 s.h.**
Same as 1L:134.

108:135 Offset Productions Workshop **3 s.h.**
Same as 1L:135.

108:140 Calligraphy I **3 s.h.**
Same as 1Y:140.

108:141 Calligraphy II **3 s.h.**
Same as 1Y:141.

108:147 Literary Publishing **3 s.h.**
Same as 8:147.

108:151 Intermediate Bookbinding **3 s.h.**
Same as 1Y:151.

108:152 Advanced Bookbinding **3 s.h.**
Same as 1Y:152.

108:187 Hand-Printed Book Problems in Design **arr.**
Same as 8:187.

108:189 Medieval Manuscripts and Handwriting **3 s.h.**

108:200 Visual Communication **3 s.h.**

108:203 History of the Book **3 s.h.**

108:210 Individual Instruction in Papermaking/Paperworks **arr.**

108:233 Introduction to Typography **3 s.h.**

108:234 Graphic Design and Production **3 s.h.**

LIBERAL STUDIES

Degree offered: B.L.S.

The Bachelor of Liberal Studies (B.L.S.) program is offered by each of the three Iowa Regents universities (The University of Iowa, Iowa State University, and the University of Northern Iowa) to serve adults whose job, family, geographic location, or other personal circumstance prevents them from attending college as full-time, on-campus students. The program has no residence requirement.

Students may complete the degree without attending a course on campus. Credit applicable toward the degree may be earned in a variety of ways, including Saturday and evening courses, correspondence and independent study courses, off-campus courses at sites throughout Iowa, televised courses, and on-campus courses during the day. Courses from any of the three Iowa Regents universities may be applied toward the degree, as may appropriate courses from other accredited institutions.

At The University of Iowa, the B.L.S. is awarded by the College of Liberal Arts and administered by the Division of Continuing Education. Since the B.L.S. is a general undergraduate degree with no traditional major, B.L.S. students may not earn minors. However, the requirements are sufficiently flexible to allow students, with the assistance of a B.L.S. adviser, to structure a program that meets their individual needs and objectives. Many B.L.S. candidates plan programs designed to help them advance in their chosen career, begin a new career, or prepare for graduate or professional study. Students who have a special career goal or

advanced degree program in mind should familiarize themselves with the required educational background or prerequisite course work so that they can incorporate appropriate courses into their B.L.S. degree program.

Admission to the B.L.S. Program

Students wishing to graduate from The University of Iowa must apply formally for admission to the B.L.S. program. Interested students should consult a B.L.S. adviser before applying. To be eligible for admission to the program, the student must have earned either:

An Associate of Arts (A.A.) degree from an Iowa area community college that participates in the 1981 Iowa Community College/Regents Articulation Agreement, with a minimum grade-point average of 2.00; or

At least 62 semester hours of collegiate work acceptable for credit toward graduation, with a grade-point average of 2.25 or better. (Students admitted to The University of Iowa must have a grade-point average of at least 2.00 to qualify for admission to the B.L.S. program.)

B.L.S. Requirements

Of the 124 semester hours of credit required for the degree, at least 45 must be earned in four-year colleges in courses defined as upper-level at the institution where the credits were earned (in the College of Liberal Arts at The University of Iowa, primarily courses numbered 100 and above); 45 must be completed in courses offered by the Iowa Regents universities; and 30 must be earned after admission to the B.L.S. program from the specific Regents university that will grant the degree.

The B.L.S. candidate must meet the general education requirements of the Regents university from which the candidate expects to receive the degree. At The University of Iowa, B.L.S. candidates are required to complete all the General Education Requirements except physical education (see the College of Liberal Arts introductory section in the *Catalog*).

Since there are no traditional majors available through the B.L.S. program, candidates must earn at least 12 semester hours of credit in each of three of the following distribution areas:

Humanities (e.g., literature, history, philosophy, religion)

Communication and arts (e.g., journalism, speech, drama, art, music)

Natural sciences and mathematics (e.g., geology, botany, statistics, computer science)

Social sciences (e.g., geography, psychology, economics, political science, anthropology)

Professional fields (e.g., business, education, nursing, social work, library science)

Of these 36 semester hours, 24 must be in upper-level courses, with at least 6 semester hours of upper-level credit in each of the three areas chosen. Credits applied to the General Education Requirements may not be used to meet the distribution area requirements but they may be counted toward the 45 semester hours of upper-level course work required if applicable.

At The University of Iowa, upper-level courses are numbered 100 and above. However, at the initiation of sponsoring departments and with approval of the College of Liberal Arts Office of Academic Programs, courses numbered below 100 but taught at an advanced level may be used to satisfy the 45-semester-hour upper-level requirement. Approved courses are listed in the Interdepartmental Studies section of the *Catalog*.

Graduation requires a minimum grade-point average of 2.00 in all course work applied toward the degree, all course work completed after admission to the program, and all upper-level course work.

All other College of Liberal Arts policies regarding pass/nonpass, satisfactory/fail, academic standards, and so forth apply to B.L.S. students.

Further information about the Bachelor of Liberal Studies program is available from the Center for Credit Programs, 116 International Center.

Courses

BLS:000 Cooperative Education Internship **0 s.h.**

LIBRARY AND INFORMATION SCIENCE

Director: Carl Orgren
Professor emerita: Velva Jeanne Osborn
Associate professors: Sharon L. (Shay) Baker, Esther Bierbaum, Carl Orgren, James Rice
Associate professor emerita: Louane L. Newsome
Assistant professors: Padmini Srinivasan, Julie Tallman, Kathleen M. Tessmer
Lecturer: Ethel Bloesch
Affiliated faculty: Kay Amert, John W. Conner
Graduate degree offered: M.A. in Library and Information Science

The School of Library and Information Science offers a program of professional and academic preparation for careers in all types of libraries and information centers—public, school, academic, and special. It seeks to recruit and prepare librarians and information professionals, to contribute to the advancement of librarianship through research, and to provide public service. The program is accredited by the American Library Association.

Program Goals and Objectives

The goals of the School of Library and Information Science are to offer a graduate program of basic professional preparation in library and information science that reflects the variety and growth of information needs felt by society and individuals; to engage in research that increases understanding of the variety of information needs and of the actions that can be taken to provide for those needs; and to provide public service through continuing education and consulting and through association and other professional service, so that growth is fostered beyond students' basic professional program, and so that people have the information service they need.

Instructional Objectives

Upon completion of the program, students are able to:

- Demonstrate an understanding of the history and theory of library and information science sufficient to recognize their role in today's society and the library's importance in the communication process;
- Articulate a philosophy of librarianship that includes an understanding of intellectual freedom and free dissemination of information; demonstrate a professional attitude toward the librarian's role as mediator between user and information; and show a commitment to improve the quality of library and information services in response to the needs of all segments of society;
- Demonstrate an understanding of information sources, the flow of information through society, and the role of libraries and information centers in the process;
- Demonstrate an appreciation for the contribution that information, libraries, and learning can make to the richness of life, and the ability to convey that appreciation to others;
- Demonstrate mastery of the techniques and procedures of effective information service (i.e., the selection, acquisition, organization, storage, retrieval, and dissemination of information);
- Identify and use bibliographic techniques and sources of information in a broad range of media formats for a variety of fields of knowledge;
- Articulate an understanding of management theory and practice sufficient to plan library and information services and perform the professional responsibilities of identifying needs, setting goals, analyzing problems, implementing programs, and evaluating results;
- Cite and evaluate research that helps in the advancement of the profession and cite and evaluate the contributions to librarianship made by related disciplines; and

• Demonstrate a commitment to professional growth.

Research Objectives

Faculty engage in research on library and information problems that advances both theoretical and practical knowledge. This includes research that directly supports the instructional program of the School of Library and Information Science.

Public Service Objectives

The school offers library and information personnel and library trustees opportunities for continuing education that advances and updates their awareness of current developments in library operations and information services. It provides consulting services to individuals, libraries, and organizations in order to promote better library and information service for the citizens of Iowa and surrounding areas. Faculty and students in the school participate in professional organizations at local, state, regional, and national levels.

Undergraduate Study

Although there is no undergraduate major in library science, juniors and seniors may enroll in the introductory library science courses (100 level). No courses numbered 100 or above may be taken by freshmen or sophomores. No courses numbered 200 or above may be taken by undergraduates.

Graduate Programs

Graduate Students Not Admitted to Master of Arts Program

Graduate students not yet admitted to the master's program in library and information science may be allowed, upon request to the director, to take one course during the application process. This course may later apply to requirements for the degree.

Graduate students in other programs may take a course only with approval of the director and the instructor of the course.

Master of Arts

Professional and academic preparation for careers in all types of libraries is provided by the school's Master of Arts program. Its graduates hold positions in public, school, academic, and special libraries and information centers, serving in roles such as administrator, information consultant, subject specialist, network coordinator, cataloger, children's librarian, school library media specialist, or conservator.

The Master of Arts degree in library and information science requires 33 semester hours of graduate credit with a minimum grade-point average of 2.50, and completion of a comprehensive examination. Five additional semester hours of credit are required for certification as a school media specialist.

Basic Plan of Study

The program consists of a core of required courses basic to all areas of librarianship, and electives. The student's plan of study should be developed carefully in relation to career objectives. All courses to be applied to the 33-semester-hour program must be approved by the adviser.

Required Core Courses

Required of all M.A. candidates; 15 s.h.

21:151 Reference
21:152 Description and Organization of Materials I
21:153 Foundations and Collection Development
21:201 Management of Libraries and Information Centers
21:246 Introduction to Information Science

Electives

Total: 18 s.h.

For suggested electives, see "Public Library Work," "College and University Library Work," "Work in Special Libraries," and "School Library Media Work" in this section of the *Catalog*.

Elective courses in other University departments must be shown to be an integral part of the student's preparation for library and information science. Although many disciplines offer cultural and intellectual support to preparation for librarianship, they do not warrant displacement of needed courses in a brief one-year program. To be applied toward the degree, electives outside the department must be taken following admission to the School of Library and Information Science, and must not exceed 6 semester hours for students having no previous courses in library science or 9 semester hours for those with previous library science courses. Only courses taken for graduate credit may be counted toward the 33-semester-hour requirement.

Thesis Option

The purpose of the thesis option is twofold: to expand research competence and to provide one means of independent study to a student with extensive preparation in library and information science. It is not intended to replace basic preparation courses.

Transfer Credit

Up to 6 semester hours of graduate credit may be accepted in transfer from another institution, provided that the work was taken in residence in a library and information science program accredited by the American Library Association. Approval is given on a course-by-course basis and is determined by evaluating the course's content, currency, and applicability to the student's program.

Completion Time

The degree program can be completed in one calendar year (two semesters and a summer), but many students take an extra semester or two to fulfill the requirements. In particular, students who have time-consuming responsibilities, such as family duties or half-time or greater employment, may find it difficult to carry the maximum course load. The maximum load for graduate students is 15 semester hours during regular semesters and 8 semester hours during summer sessions.

The degree program also can be completed in four summer sessions, but school certification requires certain courses that are available only during fall and spring semesters.

Public Library Work

Public libraries provide informational, educational, and recreational materials and a wide range of services for a diverse clientele. Public libraries usually receive the largest part of their funding from local taxes, but they often are organized on a regional or statewide cooperative basis. The variety of uses, services, materials, and organizational structures of public libraries makes this a challenging area of librarianship.

A major concern of public librarians is to design innovative service programs to reach segments of the population that are not served, as well as to provide a full range of services to all members of the community. Management skills often are needed in these positions.

Plan of Study

Required core courses	15 s.h.
Suggested electives	18 s.h.
21:231 The Public Library	3 s.h.
21:234 Library Services	3 s.h.
21:247 Information Storage and Retrieval	3 s.h.
21:248 Library Automation	3 s.h.
21:249 Research Methods	3 s.h.
21:251 Advanced Reference	3 s.h.
21:282 Practicum in Libraries	2-3 s.h.

Courses relating to service to children and young adults:

21:126 Literature and Storytelling for Children	3 s.h.
21:216 Seminar: Recent Developments in Literature for Adolescents	arr.
21:244 Library Materials for Children	3 s.h.
21:245 Library Materials for Adolescents	3 s.h.

College and University Library Work

The academic library, whether in a community college, a four-year college, or a university, provides information services in support of the teaching, research, and public service missions of the parent institution. These services include

instruction in the use of the library and its resources. Management skills and subject or language competence are often required.

Plan of Study

Required core courses	15 s.h.
Suggested electives	18 s.h.
21:232 The College and University Library	3 s.h.
21:240 Bibliography	3 s.h.
21:247 Information Storage and Retrieval	3 s.h.
21:248 Library Automation	3 s.h.
21:249 Research Methods	3 s.h.
21:251 Advanced Reference	3 s.h.
21:252 Description and Organization of Materials II	3 s.h.
21:253 Technical and Serial Services Management	3 s.h.
21:255 Government Publications	3 s.h.
21:264 Medical Librarianship and Bibliography	3 s.h.
21:265 Law Librarianship, Bibliography, and Research Techniques	3 s.h.
21:282 Practicum in Libraries	2-3 s.h.
7H:171 The Community College (required for Iowa endorsement for work in community colleges)	2-3 s.h.

Work in Special Libraries

Special librarianship includes careers in libraries and information centers serving both profit and not-for-profit organizations—for example, businesses and industries, law firms, museums, historical societies. The ability to design services suitable to the parent organization, the possession of such skills and competencies as indexing, abstracting, online searching, systems analysis, and organizing knowledge, and a background of substantial subject expertise are customarily required in special library work. Information brokers and entrepreneurs are also special librarians.

Plan of Study

Required core courses	15 s.h.
Suggested electives	18 s.h.
21:230 Special Libraries	3 s.h.
21:240 Bibliography	3 s.h.
21:247 Information Storage and Retrieval	3 s.h.
21:249 Research Methods	3 s.h.
21:251 Advanced Reference	3 s.h.
21:252 Description and Organization of Materials II	3 s.h.
21:255 Government Publications	3 s.h.
21:264 Medical Librarianship and Bibliography	3 s.h.
21:265 Law Librarianship, Bibliography, and Research Techniques	3 s.h.
21:282 Practicum in Libraries	2-3 s.h.

School Library Media Work

The school library media center makes available to students and teachers a wide range of library and instructional materials in a variety of formats. The work of the media specialist includes activities such as providing instruction to students in the use of media, consulting with teachers about the use of media in the instructional program, producing new materials, offering reading guidance, and providing reference service.

To qualify as school media specialists in Iowa, graduates must hold a valid teaching certificate and an appropriate endorsement for school library work. The plan of study in the following section describes a program that is designed to prepare students for endorsement as Iowa school media specialists K-12.

Iowa School Media Certification K-12

Students who complete the program below will fulfill state certification requirements for endorsement as a school media specialist K-12. To be admitted to the media certification program, a student must hold or be eligible for a teaching certificate. This program requires completion of 38 semester hours, 5 hours more than are required for the M.A. degree. Thus, students completing the certification program will fulfill the requirements for the M.A. in library and information science as well. The plan of study is as follows:

21:151 Reference	3 s.h.
21:152 Description and Organization of Materials I	3 s.h.
21:153 Foundations and Collection Development	3 s.h.
21:201 Management of Libraries and Information Centers	3 s.h.
21:233 School Library Media Center Administration	3 s.h.
21:244 Library Materials for Children	3 s.h.
21:245 Library Materials for Adolescents	3 s.h.
21:262 School Library Media Center Practicum	3 s.h.
7W:120 Introduction to Instructional Design and Technology	3 s.h.
7W:135 Survey of Computer Applications to Instruction	3 s.h.
21:249 Research Methods	3 s.h.
or	
7P:220 Educational Research Methodology	3 s.h.
7W:222 Instructional Strategies	3 s.h.
or	
7W:263 Consultation Theory and Practice	3 s.h.
21:222 Multi-Media Concepts in Libraries	2 s.h.
or	
7W:105 Design and Production of Media for Instruction	2 s.h.
Total	38 s.h.

Students who complete 29 of the above semester hours in a designated sequence are eligible for single-level endorsement, that is, elementary school media specialist (K-6) or secondary school media specialist (7-12).

Iowa Community College Certification

The school offers an approved program for librarian/learning resource specialist in an area vocational school or community college. Students receive this endorsement upon completion of the M.A. degree with the program listed under "College and University Library Work" in this section of the *Catalog* and 7H:171 The Community College.

Students wishing to pursue community college work in another state may want to take 7H:171 The Community College as an elective.

Joint Degree Programs

Joint degree programs between the School of Library and Information Science and other University units have as their primary goal the integration of the two areas of study, allowing the student to contribute to one discipline the insights and experience gained in the other.

The school has established formal programs with the Colleges of Law and Business Administration. A student enrolled in a joint program works with an adviser in the School of Library and Information Science to ensure the benefits of integration.

Objectives of a joint program must be consistent with the goals stated above, and since they vary from student to student, they are a matter of advising. For instance, a student who seeks a career in a law or business library requires a different sequence of courses from one attempting to study the legal basis of librarianship or the management of the library as a complex organization. Yet another student may choose to seek the benefits a joint program could offer in records management and management information systems.

To enroll in a joint program, students must apply to and be accepted by the School of Library and Information Science and the other unit chosen. Up to 6 semester hours of such study may be applied toward the M.A. in library and information science and up to 9 semester hours toward the M.B.A. or 12 semester hours to the J.D. In addition to these formal joint programs, arrangements can be made for joint programs between departments on an ad hoc basis.

In no case can a student receive two degrees with fewer than 60 semester hours of graduate work, and joint programs usually require substantially more than this.

Facilities and Resources

The School of Library and Information Science is located conveniently in the south wing of the University's Main Library, providing facilities for the varied instructional and research activities of the school.

Computer Facilities

A multipurpose computing laboratory provides student access to microcomputers. Equipment is available for CD-ROM services, online searching, use of bibliographic utilities, and use of local software.

In various courses, students learn to write programs, use and create database management systems, conduct database searches, work with word processing and spreadsheet systems, and perform statistical analyses.

Cataloging Lab

The school maintains a reference collection of cataloging tools used in description and organization courses. The collection is also available to students who need the materials for research or for other course work.

Media Lab

A media lab contains equipment and space for slide-tape production, videotape programming, super 8mm filmmaking, filmstrip production, 16mm film previewing, simple film editing, and dry mounting.

Statewide Reference Service

The school serves as one unit of a state network of libraries. In cooperation with the State Library of Iowa, students provide back-up reference service to libraries throughout the state, using learned skills to perform bibliographic verification and to answer reference questions. The service helps students reinforce and integrate classroom instruction and provides reference experience.

University Libraries

All of the resources of the University Libraries are available to students and faculty of the school. The system contains more than three million volumes in the Main Library and 11 departmental branches. More than 38 thousand monographic volumes were acquired in 1989. The serials collection is extensive, with more than twelve thousand current journal subscriptions. The third floor of the Main Library houses the government publications, map, and special collections rooms as well as bound periodicals. The location of the School of Library and Information Science on this floor allows quick access to these frequently used collections. Students have access to the second-floor cluster of computer terminals linked to the Weeg Computing Center.

Other Libraries

Students have access to a variety of libraries through field trips, practicum experience, and personal use: the State Historical Society Library in Iowa City; the Iowa City and Cedar Rapids public and school libraries; the Coe, Cornell, and Grinnell college libraries; and the Herbert Hoover Presidential Library in West Branch. The Iowa City Public Library, located only four blocks from the Main Library, was one of the first public libraries in the nation to convert to a totally computerized catalog. Its service philosophy and contemporary management practices provide students with an innovative public library model.

Other Resources

Lindquist Center, located across the street from the Main Library, houses the Learning Resources Center of the College of Education and the Weeg Computing Center. The resource center consists of the Video Lab, Computer Resource Lab, Audiovisual Production Lab, and Curriculum Resources Lab. The Curriculum Resources Lab contains an extensive collection of book and nonbook instructional materials for children in preschool through grade 12. It is especially valuable for students interested in school or public library work.

Weeg Computing Center provides instructional and research computing facilities and services for the University community. All University students, staff, and faculty may use the center's computers for University-related research, thesis preparation, and class work. Each graduate student is provided with a small funded account by the Graduate College.

Faculty Advising

Each graduate student is assigned an adviser upon admission. Students are encouraged to discuss career objectives and problems with other faculty members as well. The relatively small size of the school allows faculty members to get to know students individually and to take an interest in their professional development. All courses to be applied to the 33-semester-hour program must be approved by the adviser.

Student Activities

Students have a variety of activities available to aid in their academic and professional development. Conferences, short courses, workshops, seminars, field trips, and teleconference calls provide frequent exposure to contemporary developments in library and information science, as well as an opportunity to meet with practicing librarians from across the state and nation.

The Library and Information Science Student Organization (LISSO) is composed of all students accepted into the M.A. program. The Executive Committee of LISSO (ECL) serves as a liaison between students and faculty/administration in matters of common concern, and as a planning group for student seminars and other activities. ECL sends a representative to faculty meetings. There is also an active student chapter of the Special Libraries Association.

Placement

The school provides active placement assistance to its graduates by means of bulletin board announcements, seminars on resume writing and interviewing, and personal counseling. The University's Educational Placement Office issues a weekly listing of job openings and provides a credential file service.

Iowa graduates find positions in all types of libraries. The placement distribution for the past three years was: academic libraries 39 percent, public libraries 35 percent, school libraries 14 percent, and special libraries 12 percent. Iowa graduates currently are working in libraries in 46 states and 9 foreign countries. Strong personal and academic qualifications, job flexibility, and geographic mobility are important factors in obtaining a position.

Admission

Academic requirements for admission to the M.A. program include:

A baccalaureate degree from an accredited college or university, with a minimum grade-point average of 2.50 on a 4.00 scale, and at least 85 semester hours of study in the liberal arts and sciences;

A combined verbal/quantitative score of 1050 or a combined verbal/analytical score of 1050 on the Graduate Record Examination (GRE) General Test.

Personal qualifications and professional potential are assessed by means of letters of recommendation and an on-campus interview with the school director and other members of the faculty. Alternate interviews are arranged when distance makes it impossible for an applicant to come to Iowa City. The school does not accept every applicant who meets the minimum admission requirements; an admissions committee selects each class on a competitive basis.

Foreign students whose native or official language is not English are required to achieve a score of 560 or higher on the Test of English as a Foreign Language (TOEFL).

Applicants are requested to write to the School of Library and Information Science for a preliminary information form. If the information provided on the form indicates that the applicant satisfies the basic admission requirements, the school will schedule a personal interview.

Prospective students are urged to begin application procedures early enough to complete all requirements by the deadlines given below. Applicants must allow more time if the Graduate Record Examination (GRE) General Test has not been taken.

Completed applications should be received by the school by March 1 for fall semester

consideration, October 1 for the spring semester, or February 1 for the summer session. Decisions of the admissions committee are announced two to three weeks after each deadline. Late applications are considered if places are still available. Financial assistance, however, often is not available for late applicants.

Financial Aid

The School of Library and Information Science awards partial-tuition scholarships as well as one-quarter-time graduate assistantships. To be considered for a departmental grant, an applicant must have at least a 3.00 undergraduate grade-point average and combined verbal/quantitative scores of 1100 on the GRE General Test. Those who do not meet these requirements when entering the program may apply after completing 12 semester hours of graduate work with a 3.00 grade-point average. Prospective students are urged to apply for these awards before March 1. For information on student loans, work-study eligibility, or other financial assistance, contact the Office of Student Financial Aid, Calvin Hall.

Students interested in part-time employment should contact the libraries in the Iowa City area. Positions usually are available in the University Libraries.

Courses

21:000 Cooperative Education Internship **0 s.h.**

21:124 History of Books for Young People **3 s.h.**
Development of literature for children and young adults from oral tradition through the mid-twentieth century; trends in content and illustration; sharing of classics of the past; research project on some aspect of historical children's or young adult books.

21:126 Literature and Storytelling for Children **3 s.h.**
Rationale, materials, and techniques for sharing stories with young people; comparison and evaluation of variant texts in book and audiovisual versions; selecting stories for audiences of different ages; planning story programs; performance techniques. Same as 7E:126.

21:151 Reference **3 s.h.**
Landmark bibliographic and reference works common to most libraries: dictionaries, encyclopedias, biographical works, book catalogs, indexes and guides to periodical literature, yearbooks, and handbooks; experience in verification for interlibrary loan.

21:152 Description and Organization of Materials I **3 s.h.**
The means by which library materials are described and organized for effective retrieval: bibliographic description under AACR2; Dewey and Library of Congress classification; Sears and LC subject headings; aids and services, including OCLC; kinds and arrangements of catalogs. Same as 24:146.

21:153 Foundations and Collection Development **3 s.h.**
Introduction to the library and information professions; philosophical issues and principles as well as the methods and tools used to develop collections of library materials and resources.

21:201 Management of Libraries and Information Centers **3 s.h.**
Survey of principles of organizational design, employee motivation, communication, personnel management, planning, fiscal management, and evaluation.

21:216 Seminar: Recent Developments in Literature for Adolescents **arr.**
Same as 7S:316, 8P:316.

21:222 Multi-Media Concepts in Libraries **2 s.h.**
Nature and scope of library service beyond printed materials in school, public, and academic libraries; utilization and basic production.

21:223 History of the Book **3 s.h.**
History of the printed book; technological, social, and cultural dimensions through close reading of major texts in the field. Same as 19:251, 8:203.

21:230 Special Libraries **3 s.h.**
Management, organization, history, collection, and services as treated differently in special librarianship; visits to a variety of special libraries and information centers. Corequisites: 21:151-153 and 21:201, or consent of instructor.

21:231 The Public Library **3 s.h.**
Survey of development of the modern public library as a social agency in American society, emphasizing organization and administration, current trends and problems. Prerequisites: 21:151-153 and 21:201, or consent of instructor.

21:232 The College and University Library **3 s.h.**
Objectives, function, organization, and services of academic libraries of several kinds and sizes; standards, principles, problems, and trends. Prerequisites: 21:151-153 and 21:201, or consent of instructor.

21:233 School Library Media Center Administration **3 s.h.**
Organization and administration of library media programs; development of a philosophy, analysis of functions, program planning and evaluation; emphasis on curricular and instructional roles of the library media specialist. Pre- or corequisites: 21:151-153 and 21:201.

21:234 Library Services **3 s.h.**
Exploration of services provided for library users of all ages: history and background, determining needs, setting priorities, planning and evaluation, marketing, use of volunteers; techniques and technologies from booktalking to use of mass media.

21:240 Bibliography **3 s.h.**
Information transfer in academic disciplines; scientific method, other means of knowledge construction, resulting literatures; reference tools used to control literature for a variety of audiences; students may emphasize humanities, social sciences, or sciences. Prerequisite: 21:151.

21:244 Library Materials for Children **3 s.h.**
Exploration of library materials intended for preadolescent children: evaluation and selection of fiction and nonfiction in audiovisual as well as print formats; tools and techniques for matching the material to the needs of the child.

21:245 Library Materials for Adolescents **3 s.h.**
Exploration of library materials intended for adolescents: evaluation and selection of fiction and nonfiction in audiovisual as well as print formats; tools and techniques for matching the material to the needs of the adolescent.

21:246 Introduction to Information Science **3 s.h.**
Characteristics and techniques of information science; concepts of information storage and retrieval; mechanical and electronic applications of automation in libraries.

21:247 Information Storage and Retrieval **3 s.h.**
Examination of the theory, techniques, and procedures used to create, maintain, and evaluate information storage systems; special emphasis on online databases and database management systems in libraries. Prerequisite: 21:246.

21:248 Library Automation **3 s.h.**
Survey of the options for automating library operations; introduction to systems analysis, designing specifications, and selecting library automation systems for variety of library types and sizes; hands-on experience and demonstrations of specific systems. Prerequisite: 21:246.

21:249 Research Methods **3 s.h.**
Concepts and techniques of research in library and information sciences; emphasis on conducting and analyzing research projects.

21:251 Advanced Reference **3 s.h.**
Concepts in reference service: philosophy, communication, bibliographic instruction, evaluation; students staff statewide reference service; sources emphasized are in law, business, and statistics. Prerequisite: 21:151.

21:252 Description and Organization of Materials II **3 s.h.**
Special problems in description of materials; authority work; file structures; serials and other nonmonographic materials; Library of Congress and other classifications; subject retrieval; reclassification and other administrative issues; international bibliographic criteria; online cataloging experience. Prerequisite: 21:152.

21:253 Technical and Serial Services Management **3 s.h.**
Management principles in the provision of bibliographical and physical access to materials in libraries and information centers; site research, extensive consideration of serials. Prerequisite: 21:152.

21:255 Government Publications **3 s.h.**
Emphasis on federal documents as an information resource with some attention given to state, local, foreign, and international materials; special concerns of organizing and administering document collections. Prerequisite: 21:151.

21:262 School Library Media Center Practicum **3 s.h.**
Supervised field experience in a library media center at both elementary and secondary school levels; evaluation and discussion in seminar meetings. Open only to those who hold a standard teaching credential. Prerequisite: 21:233.

21:264 Medical Librarianship and Bibliography **3 s.h.**
Types of medical libraries; characteristics of medical literature; selection and organization of library materials; evaluation and use of reference and bibliographic tools; current awareness services. Prerequisites: 21:151-153 and 21:201, or consent of instructor.

21:265 Law Librarianship, Bibliography, and Research Techniques **3 s.h.**
Types of law libraries; characteristics of legal literature; selection and organization of legal materials; use of reference and bibliographic tools; research techniques via clinical approach. Prerequisites: 21:151-153 and 21:201, or consent of instructor.

21:272 Current Topics in Librarianship **1-3 s.h.**
Investigation and analysis of contemporary issues and problems in library and information services.

21:278 Workshop in Library Science **1-3 s.h.**
Short-term intensive study of selected topic or problem.

21:282 Practicum in Libraries **2-3 s.h.**
Supervised field experience in selected libraries; evaluation and discussion in seminar meetings. Usually taken in final semester. Consent of instructor required. Prerequisite: 12 semester hours in library science.

21:293 Independent Study **1-3 s.h.**
Student develops formal contract with faculty member. Projects carrying more than 2 semester hours require approval of director. Consent of instructor required. Prerequisite: formal proposal.

21:299 Thesis **6 s.h.**
Consent of director required. Prerequisite: 21:249.

LINGUISTICS

Chair: Catherine O. Ringen
Professors: Nora C. England, Catherine O. Ringen, Robert S. Wachal
Associate professors: William D. Davies, Alice L. Davison
Assistant professor: Robert A. Chametzky
Undergraduate degree offered: B.A. in Linguistics
Graduate degrees offered: M.A., Ph.D. in Linguistics

Linguistics is the scientific study of human language. Linguists study languages to produce accurate and complete descriptions of them and to obtain information about the nature and internal organization of language in general. They examine word structure (morphology), speech sounds (phonetics), sound systems

(phonology), sentence structure (syntax), and meaning (semantics).

Linguists also investigate how children and adults acquire language; how languages change; how damage to the brain affects language abilities; and how language varies according to region, social class, race, and sex.

Linguistics is not limited to scientific research for its own sake. People with linguistic training teach English as a second language and help clinicians retrain people with linguistic disabilities. Some help design school programs for minority Americans or intelligence and achievement tests that avoid discrimination against subjects who are not middle-class white Americans. Linguists also work in law, in the computer industry, and in foreign language translation.

Undergraduate Program

High scores on verbal, analytic, and quantitative aptitude tests are indicators of success in linguistics. Although few aspects of the field deal with numbers, students must be able to reason logically and explicitly and deal with formulas and abstract symbols. Depending on vocational goals, prospective linguistics students should consider pursuing their studies either through the M.A. in linguistics with a professional focus or through the doctorate; or they should take a second major. Appropriate companion fields include foreign languages, English, anthropology, sociology, speech pathology, psychology, mathematics, computer science, philosophy, and elementary, secondary, and special education.

Bachelor of Arts

The Bachelor of Arts degree in linguistics prepares students to do basic language analysis in syntax-semantics (sentence patterns and their relation to meanings) and phonology (sound patterns). Elective courses in a variety of subspecialties enable students to tailor the program to their own interests.

The major in linguistics requires 24 semester hours of course work. Majors must take an introductory linguistics course (103:100); courses in phonetics (103:110), phonology (103:111), and syntax (103:112); and a course in language history. The last requirement can be satisfied by taking 103:120 Historical and Comparative Linguistics, or a course in the history of some language or language family (e.g., 103:131, 103:139), or a course in an old language (e.g., Classical Greek, Latin, Sanskrit, Old English). Remaining electives are chosen with the undergraduate adviser.

Minor

The undergraduate minor in linguistics requires 15 semester hours of linguistics courses (may be cross-listed), at least 12 of which must be in courses numbered 100 or above. A minimum grade-point average of 2.00 is required, and none of the courses may be taken pass-nonpass.

Honors Program

Students may graduate with honors in linguistics by completing the major course work plus an honors thesis. The thesis must be prepared in consultation with the student's academic adviser.

Graduate Programs

The graduate programs emphasize theory and research. Students interested in nonuniversity careers also may take courses in applied linguistics and other fields, either in connection with doctoral work or as an option in the M.A. program.

Master of Arts

All students take a required set of core courses and comprehensive examinations in phonology and syntax. The required core courses are:

103:110 Articulatory and Acoustic Phonetics

103:111 Syntactic Analysis

103:112 Phonological Analysis and Theory

103:120 Historical and Comparative Linguistics

103:121 Syntactic Theory

103:122 Phonological Theory

One of the following:

103:113 Linguistic Field Methods

103:210 Linguistic Structures

103:217 Language Universals and Linguistic Typology

Students who write a thesis take at least 9 semester hours of elective courses, exclusive of thesis hours, and receive up to 6 semester hours of thesis credit.

Students who take a degree without thesis complete a focus area consisting of 12 semester hours of course work plus at least 6 semester hours of elective courses. The focus may be designed in advance by the student (subject to departmental approval) or may be one of a set of predesigned options (e.g., teaching English as a second language).

All electives must be approved by the student's adviser or chosen from a departmental list. Students who write a thesis should take at least 30 semester hours of course work; those who choose the non-thesis option must take at least 36 semester hours. All students must have a minimum of 30 semester hours of graduate credit to receive the degree, regardless of prior preparation.

Doctor of Philosophy

The highly selective Ph.D. program provides students with a strong foundation in theoretical linguistics and helps them develop the skills they will need to explore the close relationship between linguistics and related disciplines. The core requirement includes two upper-level syntax courses (e.g., 103:121 Syntactic Theory and 103:212 Advanced Syntactic Theory, two upper-level phonology courses (e.g., 103:122 Phonological Theory, and at least two seminars, for a total of 18 semester hours. An approved 18-semester-hour specialty area also is required, and students must achieve proficiency in at least two foreign languages, as specified by departmental regulations.

Comprehensive examinations cover phonological theory, syntactic theory, theory of language change (historical linguistics and sociolinguistics), and the specialty area. An oral defense of the dissertation and three years of residence also are required. In addition, all candidates are required to gain supervised experience in teaching and research.

Admission

To be considered for admission to the graduate program in linguistics, prospective students must complete an application form, submit GRE General Test scores, and have three letters of recommendation sent to the Department of Linguistics. Students whose first language is not English also must submit TOEFL scores. Applications for admission should be submitted as early as possible for the following academic year.

Financial Aid

Fellowships, teaching assistantships, and research assistantships are available to qualified graduate students. Applications are due no later than March 15, but earlier submission is encouraged. Applications for awards will be considered only for students whose application for admission is complete.

English as a Second Language

ESL instruction is offered in three distinct, but related, programs: the ESL credit support courses, the Iowa Intensive English Program (IIEP), and the Teaching Assistant Preparation in English Program (TAPE). These programs meet the needs of students whose native language is not English. The ESL credit support courses help students raise their English proficiency so they can complete a degree successfully. The IIEP provides intensive instruction for students who must raise their English proficiency to gain admission to a university or college. The TAPE program prepares students to teach in American classrooms.

ESL Credit Support Courses

These courses bridge the gap between full-time language instruction and full-time academic work, serving students whose

TOEFL scores range from 530 to 599. ESL courses are offered to increase proficiency in six skill areas: reading, writing, speaking, listening comprehension, pronunciation, and grammar. Each course grants three semester hours of credit, which count toward graduation. Courses are taught by ESL professional staff members and by teaching assistants pursuing advanced degrees in linguistics.

Iowa Intensive English Program (IIEP)

The IIEP primarily serves students who have not yet been admitted to the University and whose TOEFL scores are below 530. The program offers intensive English instruction and a cultural, social, and academic orientation to the United States. Instruction emphasizes proficiency in spoken and written English, which is crucial to college and university work. Grammar and the basic language skills of writing, reading, listening comprehension, pronunciation, and speaking are taught each day at all levels—beginning, intermediate, and advanced.

Each student receives twenty hours of classroom instruction each week, plus individual work in the language laboratory. Field trips and cultural and social experiences are an integral part of the program. Students enrolled in the IIEP have full access to all University facilities. The program welcomes international students preparing to enter universities and colleges as well as other adults who want to improve their English skills. Instruction is by full-time professional ESL instructors.

Students admitted to the IIEP receive a certificate of eligibility (Form I-20), which enables them to obtain a student visa at the nearest U.S. consulate. Application materials are available from the ESL Programs Office.

Teaching Assistant Preparation in English (TAPE)

The TAPE program is designed for graduate students whose first language is not English, who need additional work on English communication and classroom presentation techniques, and who will hold teaching assistantships while at The University of Iowa. Only students who need the program and who have a sufficient competence in English to profit from it are eligible. TAPE courses are open to graduate students who have had the TA certification evaluation and to others if space is available. Instruction is by full-time professional ESL instructors.

Facilities

The Department of Linguistics has limited acoustics equipment consisting of a sound spectrograph, a studio-type tape recorder, and an audiometric chamber. There is also a remote terminal and a personal computer available to students.

The departmental reading room allows a close relationship between faculty and students, a considerable influence of students on departmental affairs, and a high degree of individual instruction. A large part of students' education in linguistics is conducted informally through daily conversations with each other and with faculty members.

Courses

Primarily for Undergraduates

103:000 Cooperative Education Internship **0 s.h.**

103:11 Language and Society **3 s.h.**
Correlations between social and linguistic behavior; methods for discovering and describing socially significant language behavior; educational and political implications of findings. GER: social sciences.

103:13 Language and Formal Reasoning **3 s.h.**
Introductory natural language semantics, with emphasis on formal study of linguistic meaning through logical analysis; meaning in linguistics, logical analysis of predication and quantification, argumentation. GER: quantitative or formal reasoning.

103:99 Special Project **arr.**
Independent research on a linguistic topic, directed by a staff member.

For Undergraduates and Graduates

103:100 Introduction to Linguistics **3 s.h.**
Variety of topics in general linguistics. Same as 8L:100.

103:105 Language, Society, and Education **3 s.h.**
Socially conditioned attitudes to language use; development of prescriptivism, linguistic indicators of socioeconomic status, concepts of a "standard" language, and dialects of a language. Same as 8L:159.

103:106 Teaching English as a Second Language **3 s.h.**
Methods and techniques of teaching English as a second or foreign language; extensive peer teaching based on American English phonology and syntax. Prerequisites: 103:110 and 103:141.

103:107 Practicum in Teaching English as a Second Language **3 s.h.**
Practical experience in teaching English as a foreign language under supervision. Consent of instructor required. Prerequisite: 103:106.

103:110 Articulatory and Acoustic Phonetics **3 s.h.**
Articulatory and acoustic phonetic theory; intensive practice in phonetic transcription.

103:111 Syntactic Analysis **3 s.h.**
Introduction to syntactic analysis, using basic syntactic concepts applied to English and other languages.

103:112 Phonological Theory and Analysis **3 s.h.**
Basic concepts of phonological theory; solution of problems in phonological analysis, making use of data from a variety of languages. Prerequisite: 103:110.

103:113 Linguistic Field Methods **3 s.h.**
Gathering and collation of language data in the field; theory and practical problems; extensive practice in eliciting data from an informant. Prerequisites: 103:110, 103:111, and 103:112.

103:114 Computational Linguistics **3 s.h.**
Introduction to computational linguistics.

103:115 Language Processing **3 s.h.**
Topics vary. Same as 31:113.

103:119 Topics in Portuguese Linguistics **3 s.h.**
Same as 38:119.

103:120 Historical and Comparative Linguistics **3 s.h.**
Principles of linguistic change; comparative method and genetic classification of languages; internal reconstruction and language typology. Prerequisite: 103:112. Same as 8L:120.

103:121 Syntactic Theory **3 s.h.**
Examination of current generative theory and linguistic argumentation; critical analysis of research. Prerequisite: 103:111.

103:122 Phonological Theory **3 s.h.**
Basic issues in generative phonological theory. Prerequisite: 103:112.

103:131 History of the English Language **3 s.h.**
Development of phonological and grammatical structure of English from Old to Modern English; dialectal differentiation in English. Prerequisite: 103:100 or equivalent. Same as 8L:131.

103:132 Elementary Old English **4 s.h.**
Structure; historical position in the Germanic group of languages; selected texts. Same as 8L:132.

103:139 Chinese Historical Phonology **3 s.h.**
Same as 39:139.

103:141 The Structure of English **3 s.h.**
Detailed analysis, including topics of interest to teachers of English as a foreign language. Pre- or corequisite: 103:111.

103:142 Modern English Grammar **3 s.h.**
Views of traditional grammarians vis-a-vis contemporary approaches; views on English usage. Same as 8L:142.

103:145 Methods of Teaching English as a Second Language **3 s.h.**
Methods and materials for teaching English as a second/foreign language; observations of ESL and intensive English classes at the University, design and presentation of short lessons, text evaluation, and demonstrations of innovative approaches of the last decade. Prerequisites: 103:110 and 103:141.

103:150 Language and Gender **3 s.h.**
Investigation of gender-related language variation; current research on gender-specific linguistic forms and usage in the United States and other language communities; introduction to relevant principles of linguistic theory and analysis. Same as 131:147, 113:173.

103:151 Formalisms **3 s.h.**
Basic logic for analyzing argumentation in linguistics (validity, soundness, necessary conditions, sufficient conditions, proof construction); basic mathematics and logic for the analysis of natural languages (propositional and predicate calculus, set theory, axiomatic method, functions, relations, basic automata theory).

103:163 Philosophy of Language **3 s.h.**
Consent of instructor required. Same as 26:189.

103:170 Language and Culture **3 s.h.**
Prerequisites: 113:3, and 113:171 or 103:100 or consent of instructor. Same as 113:172.

103:171 Anthropological Linguistics **3 s.h.**
Same as 113:171.

103:172 Psychology of Language **1-4 s.h.**
Same as 3:117.

103:173 Applied Linguistics **3 s.h.**
Psycholinguistic theories of second language acquisition.

103:175 Introduction to Semantics **3 s.h.**
Overview of meaning in natural language mapped onto lexical and syntactic structures; formal logical and set theory description; discussion of truth conditions, compositionality, presupposition, definiteness, and quantification in natural language. Prerequisite: 103:111 or equivalent.

103:176 Language Development **1-3 s.h.**
Prerequisite: 103:172 or 103:100 or consent of instructor. Same as 3:118.

103:177 Neural Processes of Speech and Language **3 s.h.**
Same as 3:116.

103:178 Error Analysis **3 s.h.**
Research literature on analyzing errors of second language learners. Prerequisites: 103:111, 103:112, 103:141, and 103:173.

103:199 Special Projects 3 s.h.
Selected theoretical and applied topics in linguistics.

Primarily for Graduates

103:205 History of Linguistics 3 s.h.
Topics in history of linguistic theory.

103:210 Linguistic Structures 3 s.h.
Analysis of grammatical and/or phonological structure of a selected language or language family; language(s) vary. May be repeated with different language. Consent of instructor required.

103:212 Advanced Syntactic Theory 3 s.h.
Recent developments in syntax; analysis of the nature of linguistic data, argumentation, and assumptions. Prerequisite: 103:121.

103:216 Sociolinguistics and Dialectology 3 s.h.
Theory and methodology of intralanguage variation; relationship between language variants and socioeconomic class, sex, ethnicity, and geography. Prerequisite: 103:100.

103:217 Language Universals and Linguistic Typology 3 s.h.
Examination of proposed universal principles of linguistic structure; approaches to classification of languages on the basis of grammatical and phonological structure. Consent of instructor required. Prerequisite: 103:100 or equivalent.

103:218 Psycholinguistics 3 s.h.
Prerequisite: 3:117 or consent of instructor. Same as 3:218.

103:220 Seminar: Anthropological Linguistics arr.
Same as 113:271.

103:231 History of the German Language 3 s.h.
Same as 13:241.

103:232 History of the Scandinavian Languages 3 s.h.
Same as 13:249.

103:251 Old Norse 3-4 s.h.
Same as 8L:198.

103:252 Middle High German 3 s.h.
Same as 13:243.

103:260 Historical Ibero-Romance Language I 3 s.h.
Same as 35:205.

103:261 Historical Ibero-Romance Language II 2 s.h.
Same as 35:206.

103:262 Comparative Romance Linguistics 3 s.h.
Same as 20:201, 35:207, 9:250.

103:272 Learning, Memory, and Cognition 3 s.h.
Same as 31:225.

103:275 Acoustics and Biomechanics of Speech 5 s.h.
Prerequisites: 3:112 and 3:120, or consent of instructor. Same as 3:250.

103:277 Physiology of Speech Production 5 s.h.
Prerequisites: 3:112 and 3:120, or consent of instructor. Same as 3:252.

103:300 Seminar: Spanish Linguistics 3 s.h.
Same as 35:300.

103:312 Seminar: Problems in Linguistics 3 s.h.
Intensive study of theoretical and practical problems.

103:320 Seminar: Psycholinguistics 2 s.h.
Consent of instructor required. Same as 3:533.

103:370 Seminar: Speech Science 2 s.h.
May be repeated. Consent of instructor required. Same as 3:532.

103:390 Special Projects arr.

103:400 Master's Thesis arr.

103:450 Ph.D. Thesis arr.

Special English Courses

For students whose first language is not English.

103:1 Iowa Intensive English: Communication Skills 0 s.h.
Aural comprehension, spoken English, and American attitudes, values, and customs; giving and receiving information, interviewing Americans, and discussing, understanding, and accepting cultural differences; beginning, intermediate, and advanced.

103:2 Survival English 3 s.h.
Language skills necessary for everyday life in the United States; common vocabulary, basic grammar in conversation and listening. For speakers of basic-level English. Offered only through Saturday and Evening Class Program.

103:3 Iowa Intensive English: Reading 0 s.h.
Effective reading: skills and practice of reading strategies using newspapers, popular magazines, schedules, documents, academic textbooks, correspondence, and literature; beginning, intermediate, and advanced.

103:4 Iowa Intensive English: Grammar 0 s.h.
Correct use of grammatical structures of English; extensive practice to achieve communicative competence in English; beginning, intermediate, and advanced.

103:5 Iowa Intensive English: Writing 0 s.h.
Personal and formal writing; journal entries, letters, critiques, essay exams, and short papers that involve library use; revising and editing; beginning, intermediate, and advanced.

103:6 TA Preparation in English: Fluency Building and Culture 0 s.h.
Pronunciation, conversational fluency, and knowledge of American culture.

103:7 TA Preparation in English: Pronunciation 0 s.h.
Intensive work toward maximum intelligibility; emphasis on stress, timing, and intonation.

103:8 TA Preparation in English: Presentation Skills 0 s.h.
Intelligibility of speech and clarity of expression in presenting and responding; practice in videotaped lectures; student expectations and classroom management in an American university.

103:9 TA Preparation in English: Orientation 0 s.h.
Student expectations, typical teacher-student relationships, and basic classroom management in an American university.

103:184 English as a Second Language: Conversation Skills 3 s.h.
Structured opportunity to develop fluency in spoken English; speaking skills for the American academic setting and in American society; introduction to pronunciation, grammar, and vocabulary. TOEFL score of 530 or consent of ESL coordinator required.

103:185 English as a Second Language: Pronunciation and Oral Skills 3 s.h.
Development of skills appropriate to formal speaking, diagnosis and correction of persistent pronunciation problems, correct use of stress and intonation; oral presentations, discussions; work in the Language Media Center. TOEFL score of 530 or consent of ESL coordinator required.

103:186 English as a Second Language: Grammar 3 s.h.
The structure of English; troublesome grammar patterns. TOEFL score of 530 or consent of ESL coordinator required.

103:187 English as a Second Language: Writing 3 s.h.
Complex grammatical constructions, discourse considerations, and use of formal vocabulary expected from university students; styles of organization, types of argumentation, and methods of analysis used in academic writing. TOEFL score of 530 or consent of ESL coordinator required.

103:188 English as a Second Language: Listening Comprehension 3 s.h.
Recognizing English sound contrasts, grammatical structures, and common vocabulary; practice in listening to classroom lectures and in note taking; listening to different dialects and styles of speaking, identifying main points, selecting supporting details; work in the Language Media Center. TOEFL score of 530 or consent of ESL coordinator required.

103:189 English as a Second Language: Reading Skills 3 s.h.
Increasing reading speed and comprehension of university-level writing and vocabulary; exercise, discussion, and note-taking assignments to develop critical analysis skills. TOEFL score of 530 or consent of ESL coordinator required.

LITERATURE, SCIENCE, AND THE ARTS

Chair: William H. Klink
Professors: Judith P. Aikin (German), David Baldus (Law), Joel Barkan (Political Science), Richard M. Caplan (Medicine), Lane Davis (Political Science), D. Martin Jenni (Music), Paul Heidger (Anatomy), William H. Klink (Physics and Astronomy), Richard Lloyd-Jones (English), Donald G. Marshall (English), Alan F. Nagel (English and Comparative Literature), Harry Oster (English), John A.A. ter Haar (German), Alan I. Widiss (Law), Fredrich Woodard (English)
Associate professors: William E. Duffy (Foundations, Postsecondary, and Continuing Education), Evan Fales (Philosophy), N. Katherine Hayles (English), David E. Klemm (Religion), Herman Rapaport (English), John R. Stratton (Sociology), Stephen G. Wieting (Sociology)
Assistant professors: Catherine A. Cole (Marketing), Kenneth J. Cmiel (History), Kathleen E. Diffley (English), Sabine I. Golz (German and Comparative Literature), John B. Harper (English)
Undergraduate degree offered: B.A. in Literature, Science, and the Arts

The Interdisciplinary Program in Literature, Science, and the Arts (LSA) is designed to provide elective courses for all students. The Bachelor of Arts major in LSA offers a liberal education broader than that permitted by the requirements for a major in a single subject area; it emphasizes skills in writing, analytical thinking, and discussion while requiring coordination of courses across the disciplines of the liberal arts.

Students completing the LSA major may find that it prepares them for graduate study in the professions, humanities, or social sciences.

LSA courses are open to juniors, seniors, and graduate students from any department or college. Sophomore students occasionally may be admitted by approval of the instructors.

Courses are conducted by round-table discussion in a small group of students with two or more faculty representing different departments and disciplinary perspectives. The topics of these courses engage the special contributions of particular disciplines, while focusing on important problems of value and judgment in our times. Reading lists are chosen from outstanding works of the past and present.

Specific requirements—beyond the general education courses—for the B.A. in Literature, Science, and the Arts are as follows:

LSA	12 s.h.
Natural, social sciences	12 s.h.
Philosophy, religion, history	12 s.h.

Literature beyond General Education Requirements 12 s.h.
Fine arts 3 s.h.
Foreign language: one semester beyond second year (Foreign literature courses in the original language may also be used to satisfy the requirement in literature.) 3 s.h.

Students considering an LSA major should consult with the program chair before the end of the sophomore year.

Honors

Superior students who undertake a further program of independent study may earn the Bachelor of Arts degree with honors. To be admitted as candidates for honors, students must have the endorsement of the chair of the Interdisciplinary Program in Literature, Science, and the Arts and meet requirements for the College of Liberal Arts Honors Program. Honors students submit an honors project and present its results to an Honors Committee.

Courses

33:111 Myth and Reason 2-4 s.h.
Interplay between myth and reason as significant patterns in Western thought; readings from Sophocles, Plato, Milton, Nietzsche, anthropologists, and novelists.

33:121 The Good Society 2-4 s.h.
Man's life in society and the potentials of man's life in society, as seen in works by Plato, Rabelais, Machiavelli, Shakespeare, Locke, Gibbon, Marx; recent fiction and nonfiction. GER: humanities.

33:122 The Experience of Politics 2-4 s.h.
Political experience as presented in biographical and autobiographical works.

33:125 Crimes and Punishments 2-4 s.h.
Society's varying attitudes and reactions to crime and punishment as reflected in history, literature, and social theory.

33:131 The Family in Law and Society 2-4 s.h.
Family viewed from multiple perspectives; emphasis on legal and social definitions and functions, historical and cultural varieties of families, and imaginative representations in literature.

33:151 Individuals and Institutions 2-4 s.h.
Relationships between individuals and institutions through outstanding works of literature, social science, and law by authors such as Plato, Sophocles, Burke, de Tocqueville, Melville, and Alexander Bickel.

33:152 Values in the Contemporary World 2-4 s.h.
Modern problems in definition and choice of values, examined through writings of contemporary ethical theorists and novelists.

33:153 Hard Cases: Science Policy and Values 3 s.h.
Investigation of major issues in practical ethics through difficult case studies in fields such as law, medicine, business, and politics; readings in classic authors, such as Plato, Aristotle, Kant, and Mill, and recent contributions from several disciplines.

33:154 Human Nature and the Impact of Science 2-4 s.h.
Relationship of scientific, humanistic, social, and religious thought. GER: humanities. Same as 13:154.

33:156 Law, Medicine, and Society 2 s.h.
Works of literature that provoke questions at the intersection of contemporary medicine, law, and ethics; reading and discussion.

33:161 Form and Milieu in the Arts 2-4 s.h.
Interplay between art forms and other cultural patterns, institutions, and rituals; close examination of creative and theoretical writings, specific works of music, and graphic art. GER: humanities.

33:163 Images of Business in American Literature 2-4 s.h.
Exploration of values, goals, dreams, and life-styles of individuals in the world of business, as encountered in works of American fiction, drama, and nonfiction prose from the 1880s to the present.

33:164 Roots of Modern Culture 2-4 s.h.
Literary and social manifestations of modern romanticism.

33:172 Poetry and Song 2-4 s.h.
Survey of literature and music across a range of several centuries; comparison of literary and musical forms, historical and cultural contexts of a work's composition and of its performances, style, and evaluation; the use and value of the arts.

33:180 Special Projects arr.

33:191 Independent Study for Honors 2-4 s.h.
Honors candidates must repeat the course for a total of 6 s.h.

DIVISION OF MATHEMATICAL SCIENCES

Undergraduate degrees offered: B.A., B.S. in Mathematical Sciences

The Division of Mathematical Sciences is composed of the Departments of Computer Science, Mathematics, and Statistics and Actuarial Science. For descriptions of these programs, see "Computer Science," "Mathematics," and "Statistics and Actuarial Science" in this section of the *Catalog*.

The B.A. and B.S. in Mathematical Sciences are being phased out, since each department listed above offers its own undergraduate major. Beginning August 1990, the mathematical sciences degrees are closed to new majors. Those already in the programs must complete the degree requirements by August 1993. For a description of the program requirements, see the *1988-90 General Catalog*.

APPLIED MATHEMATICAL SCIENCES

Chair: Herbert W. Hethcote
Faculty: Kendall E. Atkinson (Mathematics), Dennis L. Bricker (Industrial and Management Engineering), Gregory R. Carmichael (Chemical and Biochemical Engineering), Ching-Jen Chen (Mechanical Engineering), Donald D. Dorfman (Psychology), Peter A. Getting (Physiology and Biophysics), Edward J. Haug (Mechanical Engineering/Civil and Environmental Engineering), Herbert W. Hethcote (Mathematics), William H. Klink (Physics and Astronomy), Kenneth O. Kortanek (Management Sciences), George E. Knorr (Physics and Astronomy), Karl E. Lonngren (Electrical and Computer Engineering), R. Rajagopal (Geography/Civil and Environmental Engineering), Roger K. Shultz (Computer Science), George Woodworth (Statistics and Actuarial Science)
Graduate degree offered: Ph.D. in Applied Mathematical Sciences

Applied mathematical scientists formulate scientific concepts and problems in mathematical terms; solve the resultant mathematical problems; and discuss, interpret, and evaluate the solutions. They explore ideas for and areas of mathematical application and develop mathematical theories in new areas.

Career opportunities for applied mathematicians include faculty positions in colleges and universities, research positions in industrial and governmental laboratories, and professional consulting positions.

Program

The Program in Applied Mathematical Sciences at The University of Iowa is an autonomous, broad-based interdisciplinary program leading to the Doctor of Philosophy degree. The program helps students achieve a command of theoretical and applied aspects of a mathematical science (mathematics, statistics, or computer science) and obtain basic knowledge of at least one science (behavioral, biological, engineering, medical, physical, or social). The program is flexible, so students can concentrate on applied mathematics, such as differential equations and numerical analysis, or on other applicable techniques in mathematics, statistics, or computer science.

Applicants should have a strong background in a mathematical science and a desire to apply a mathematical science to relevant scientific problems in another science. Students may enter with either a bachelor's or master's degree.

Plan of Study

Faculty members help each student plan a course of study that is consistent with the student's background, interests, and goals. They also help the student find a suitable thesis problem and supervisor.

Students' individual programs are designed to help them develop expertise in methods of applying a mathematical science; build a good foundation in related topics of theoretical mathematics, statistics, or computer science; and provide sufficient knowledge in a particular science so that students can use mathematical science techniques in that science. Students can arrange their study plans so that they can earn a master's degree from a science or a mathematical science department after they complete part of their plan.

Comprehensive Exam

Ph.D. comprehensive examinations cover three areas: theoretical foundations in a mathematical science, methods of application, and the chosen scientific area. One program objective is to have each student's dissertation research include many of the activities of an applied mathematical scientist. For example, a student might formulate a model, do a quantitative analysis of the model, and interpret the results.

Assistantships, Application for Admission

Research and teaching assistantships are available to qualified applicants. Support for students as research assistants is available during the summers. Applications for fall semester admission and for financial support should be received by March 1. For application forms and more information about the academic program, write to the chair of the Program in Applied Mathematical Sciences, The University of Iowa, Iowa City, Iowa 52242.

Courses

22A:397 Seminar in Applied Mathematical Sciences arr.
Consent of instructor required.

22A:399 Reading and Research arr.
Consent of adviser required.

COMPUTER SCIENCE

Chair: Arthur C. Fleck
Professors: Donald A. Alton, Donald L. Epley, Arthur C. Fleck, Gregg Oden (Psychology)
Associate professors: Robert J. Baron, Steven C. Bruell, Sukumar Ghosh, Douglas W. Jones, Teodor Rus
Assistant professors: Marc Armstrong (Geography), Mahesh Dodani, Joseph K. Kearney, Chen-ho Kung, Monagur Muralidharan, Hyung-Sik Park, Kenneth Slonneger, Hantao Zhang
Lecturer: William F. Decker
Visiting lecturer: Robert Christiansen
Undergraduate degrees offered: B.A., B.S. in Computer Science
Graduate degrees offered: M.S., Ph.D. in Computer Science

Undergraduate Programs

Undergraduate students majoring in computer science must develop competence in mathematics, programming languages, and computer systems. They also must explore at least one area of potential computing applications through a required elective program. Students have great flexibility in their choice of area, but specific courses in that area must be approved by a computer science adviser. The *Computer Science Undergraduate Handbook* available for purchase at the Iowa Memorial Union Bookstore, suggests possible elective areas and discusses the Cooperative Education Program and student groups such as the University's chapter of the Association for Computing Machinery.

Pre-Computer Science

Entering students who want to major in computer science are designated pre-computer science majors until they have met the entry requirements of the computer science major. Students continue on pre-computer science status until they complete the first four required courses of the major:

22C:16 Introduction to Programming with Pascal	4 s.h.
22C:17 Programming Techniques and Data Structures	3 s.h.
22C:18 Computer Organization and Assembly Language Programming	4 s.h.
22M:25 Calculus I	4 s.h.
or	
22M:35 Engineering Calculus I	4 s.h.
or	
22M:45 Accelerated Calculus I	4 s.h.

Upon completion of these courses, students are evaluated for entry into the computer science major. The requirements for entering the major are satisfied by meeting the following three conditions:

A grade-point average of at least 2.46 in the above required courses (pre-computer science grade-point average);

A minimum grade of C- in each of the required courses; and

An overall grade-point average of at least 2.00.

Transfer students who have taken a course approved as equivalent to one of the pre-computer science courses are exempt from that course, provided the transfer grade is at least a B-. Such transfer grades are used in computing the pre-computer science grade-point average.

After admission to the major, following successful completion of the pre-computer science requirements, students must maintain a grade-point average of 2.00 or higher in the courses required for the B.A. or B.S. in computer science (see "Bachelor of Arts" and "Bachelor of Science" below) in order to remain in the major and to receive the B.A. or B.S. degree in computer science.

Students who want an exception to a departmental requirement should contact the department for a petition form.

Advanced Placement

The Computer Science Advanced Placement test can be used to gain credit for 22C:16 and/or 22C:17. See the *Computer Science Undergraduate Handbook* for more details.

Bachelor of Arts

The General Education Requirements for this degree are stated in the "College of Liberal Arts" section of the *Catalog*.

For the B.A. degree, the following computer science core courses are required:

22M:25 Calculus I	4 s.h.
or	
22M:35 Engineering Calculus I	4 s.h.
or	
22M:45 Accelerated Calculus I	4 s.h.
22M:26 Calculus II	4 s.h.
or	
22M:36 Engineering Calculus I	4 s.h.
or	
22M:46 Accelerated Calculus II	4 s.h.
22M:27 Introduction to Linear Algebra	4 s.h.
22C:16 Introduction to Programming with Pascal	4 s.h.
22C:17 Programming Techniques and Data Structures	3 s.h.
22C:18 Computer Organization and Assembly Language Programming	4 s.h.
22C:19 Discrete Structures I	3 s.h.
22C:21 Algorithms and Data Structures	3 s.h.
22C:23 Programming Language Concepts	3 s.h.
22C:31 Digital Systems and Computers	3 s.h.
22C:32 Introduction to Systems Software	3 s.h.
Total	38 s.h.

In addition, an approved elective program of at least 12 semester hours is required, as described below.

Bachelor of Science

The General Education Requirements for this degree are stated in the "College of Liberal Arts" section of the *Catalog*. Courses that satisfy General Education Requirements, if chosen carefully, may also satisfy the departmental natural science sequence requirement as described below.

Students must complete all the previously stated computer science requirements for the B.A. degree, including the approved elective program of at least 12 semester hours. In addition, they must meet the following three requirements:

Completion of two advanced courses selected from those listed below;

Completion of 22S:120 Probability and Statistics or another probability and statistics course with a calculus prerequisite, as approved by the computer science adviser; and

Completion of a two-semester sequence in a natural science acceptable toward a major in that science; these courses ordinarily are chosen to also satisfy the College of Liberal Arts General Education Requirement in natural sciences; CLEP/APP credit cannot be used to satisfy all or part of this requirement; approved natural science sequences are listed below.

Advanced Courses

22C:51 Computer Graphics	3 s.h.
22C:55 Elementary Numerical Analysis	3 s.h.
22C:59 Discrete Structures II	3 s.h.
22C:96 Topics in Computer Science	arr.
22C:99 Honors in Computer Science (if repeated, may be counted only once as an advanced course)	arr.
22C:115 Software Engineering I	3 s.h.
22C:116 Operating Systems and Concurrent Programming	3 s.h.
22C:120 Software Engineering II	3 s.h.
22C:122 Advanced Computer Organization and Architecture	3 s.h.
22C:123 Programming Language Foundations	3 s.h.
22C:125 Data: Abstractions, Types, and Structures	3 s.h.
22C:127 Introduction to Compiler Construction	3 s.h.

22C:132 Parallel Programming	3 s.h.
22C:135 Introduction to Computation Theory	3 s.h.
22C:144 Database Management Systems	3 s.h.
22C:145 Artificial Intelligence I	3 s.h.
22C:146 Computer Vision and Robotics	3 s.h.
22C:153 Design and Analysis of Algorithms I	3 s.h.
22C:167 Theory of Graphs	3 s.h.
22C:178 Computer Communications	3 s.h.
22C:195 Topics in Software Engineering	arr.
22C:196 Topics in Computer Science (if repeated, may be counted only once as an advanced course)	arr.
22C:198 Individual Programming Projects (if repeated, may be counted only once as an advanced course)	arr.
22M:170 Numerical Analysis: Nonlinear Equations and Approximation Theory	3 s.h.
22M:171 Numerical Analysis: Differential Equations and Linear Algebra	3 s.h.
22M:174 Optimization Techniques	3 s.h.
22M:176 Topics in the Numerical Solution of Partial Differential Equations	3 s.h.

These courses cannot be taken pass/nonpass. Students with certain special elective programs may petition for additional courses to be accepted for this requirement.

Natural Science Sequences

For the B.S. degree, students must take two or more courses in a sequence required of majors in a chosen area of natural science. The first course must be a prerequisite to the second. This study should enhance the student's perspective by providing a deeper understanding of the scientific method. It is typical, but not required, that these courses be taken in the same science department. This cognate sequence must total at least eight semester hours and may also be chosen to satisfy the natural sciences General Education Requirement. Some possible choices are listed below, and the computer science adviser may approve others.

Astronomy

29:61 General Astronomy (GER, lab)	4 s.h.
29:62 General Astronomy (GER, lab)	4 s.h.

Biology

4:13 Principles of Chemistry I (GER)	3 s.h.
37:3 Principles of Animal Biology (GER, lab)	5 s.h.

Botany

2:1 Introduction to Botany (GER, lab)	4 s.h.
2:100 Land Plants: An Evolutionary Survey (not a natural sciences GER)	4 s.h.

Chemistry

4:13 Principles of Chemistry I (GER)	3 s.h.
4:14 Principles of Chemistry II (GER)	3 s.h.
4:16 Principles of Chemistry Lab I (GER, lab)	2 s.h.

Geology

12:5 Introduction to Geology (GER, lab)	4 s.h.
12:6 Evolution of the Earth (GER, lab)	4 s.h.

Physics

29:17 Introductory Physics I (GER, lab)	4 s.h.
29:18 Introductory Physics II (GER, lab)	4 s.h.

Required Elective Program

For the B.A. or B.S. degree, students must take at least 12 semester hours of electives in a thematic area with potential computing application, such as business, engineering, physics, or another field in which they plan to apply the computer science degree. These courses must be approved by the student's computer science adviser beforehand and cannot be taken pass/nonpass. See the *Computer Science Undergraduate Handbook* for more details and examples of approved elective programs.

Honors

Any University of Iowa student with a cumulative grade-point average of 3.20 or higher may join the College of Liberal Arts Honors Program; interested students should contact the honors program office in the Shambaugh House Honors Center.

To graduate with honors in computer science, students must complete 4-6 semester hours of 22C:99 Honors in Computer Science and submit an acceptable honors thesis (22C:99 can count as one but not both of the two advanced courses for the B.S.). To take 22C:99, students must have the consent of a computer science faculty member. The faculty member must know the nature of the intended project for the honors thesis, a plan or timetable for the work, and the nature of the thesis itself. Students are responsible for finding a faculty member willing to supervise their honors project. See the *Computer Science Undergraduate Handbook* for more details.

Minor

To earn a minor in computer science, students must complete a minimum of 15 semester hours of computer science courses, at least 12 of which must be taken in advanced University of Iowa course work. For the minor only, the following courses are considered advanced: 22C:9 and 22C-prefix courses numbered higher than 22C:16, excluding 22C:100-22C:109. All of the advanced courses have prerequisites, so a typical minor will consist of 22C:16, 22C:17, 22C:18, and two additional courses numbered higher than 22C:18; or 22C:9, 22C:16, 22C:17, 22C:18, and one additional course numbered higher than 22C:18.

Graduate Programs

Master of Science

Candidates for the M.S. degree in computer science must complete the following courses or acquire equivalent proficiency.

22C:116 Operating Systems and Concurrent Programming	3 s.h.
22C:122 Advanced Computer Organization and Architecture	3 s.h.
22C:123 Programming Language Foundations	3 s.h.
22C:135 Introduction to Computation Theory	3 s.h.
A 200-level 22C course	3 s.h.
Three additional graduate-level 22C courses	9 s.h.
Approved courses outside computer science	6 s.h.
Total	30 s.h.

Outside courses must be selected to support the students' career objectives and must be approved by the adviser. The courses must broaden students' background through study of a new area or extend students' earlier work outside of computer science.

Computer science courses should be selected according to students' special area interests but also should provide a broad range of experience and competence in computer science. In particular, some experience with projects involving extensive programming should be included.

M.S. candidates may elect to write a thesis, and with their adviser's consent may apply up to 8 semester hours of thesis credit toward the minimum total of 30 semester hours of credit required for the M.S. degree.

The M.S. final examination consists of either an oral defense of the thesis or a written examination that assumes completion of 22C:116 Operating Systems and Concurrent Programming, 22C:122 Advanced Computer Organization and Architecture, 22C:123 Programming Language Foundations, and 22C:135 Introduction to Computation Theory. The written examination attempts to confront the interfaces among these four courses as well as the major topics in the individual courses. Students should consult the *Computer Science Graduate Handbook* for further information.

Applicants for admission to the M.S. program in computer science usually are required to have a background equivalent to a B.A. or B.S. in computer science. In special cases, students lacking one or more of the undergraduate requirements may be admitted to the graduate program. In such cases, the student is required to complete these courses prior to admission to graduate courses.

Doctor of Philosophy

Doctoral students are expected to complete 80-90 semester hours of graduate work, including a thesis. Students need not have a master's degree when beginning the Ph.D. program, and need not acquire one. Course

requirements or equivalent proficiency for the doctorate include:

22C:116 Operating Systems and Concurrent Programming	3 s.h.
22C:122 Advanced Computer Organization and Architecture	3 s.h.
22C:123 Programming Language Foundations	3 s.h.
22C:125 Data: Abstractions, Types, and Structures	3 s.h.
22C:127 Introduction to Compiler Construction	3 s.h.
22C:135 Introduction to Computation Theory	3 s.h.
22C:144 Database Management Systems	3 s.h.
22C:145 Artificial Intelligence I	3 s.h.
22C:153 Design and Analysis of Algorithms I	3 s.h.

Students also must complete at least 18 semester hours of 200-level computer science course work in addition to 22C:299 Research for Dissertation.

In addition to the course work in computer science, students must complete at least three courses, with grades of A or B, in one of these outside areas: algebra, analysis, logic and set theory, operations research, statistics and probability, and numerical analysis.

At least one course in the outside area must be at the 200 (advanced) level, except in statistics and probability, where the advanced course may be at the 100 level.

After students pass the qualifying examination, they select a faculty adviser to direct their research. Students and their advisers select the dissertation committee.

In consultation with the adviser and dissertation committee, students prepare a plan of study and specifications for a specialty examination that will serve as the Ph.D. comprehensive examination. The dissertation committee administers the specialty examination after most of the required course work is completed.

Examinations are described in the *Computer Science Graduate Handbook*. Students prepare a written proposal for research and present an oral defense to the dissertation committee. They must demonstrate expertise in the area of proposed research and justify the proposal in terms of originality and significance.

Students must make a final oral defense of the completed dissertation.

The department is highly selective in admitting doctoral students and usually considers only applicants with a grade-point average above 3.30.

Graduate Service Courses

Competence and experience in the use of a digital computer in problem solving is useful for and often prerequisite to advanced study and research in many disciplines. For most students, the two-semester sequence, 22C:106 Introduction to Programming with Pascal and 22C:107 Programming Techniques and Data Structures, is recommended. Students in fields in which other programming languages are heavily used may find 22C:100 Introduction to Computing with FORTRAN or 22C:109 Programming with COBOL more appropriate.

Courses

Primarily for Undergraduates

22C:000 Cooperative Education Training Assignment **0 s.h.**
An on- or off-campus work experience with a selected business or company that integrates classroom and job experiences prior to career decisions; assignments usually alternate with on-campus semesters; see "Cooperative Education" in the "Student Life at Iowa" section of the *Catalog*. Consent of department required. Prerequisite: completion of the pre-computer science requirements.

22C:1 Survey of Computing **3 s.h.**
The nature, uses, and limitations of computers and computing as evidenced in a broad sample of computing techniques, including batch and interactive computing, packaged programs, nonnumeric programming, computer-assisted instruction, information retrieval; the impact of computing technology on society. Not open to students who have taken a higher-numbered 22C course or 6K:70.

22C:5 Problem Solving and Computing **3 s.h.**
Problem solving as an intellectual exercise; study of strategies and tactics useful in problem decomposition; distinctions between the notions of problems, solutions, and implementations; problem solving and programming as forms of transformation between these notions; representation of information, objects, operations, and processes; representation of solutions in different forms on the computer. Prerequisite: satisfaction of the admission requirement in mathematics.

22C:7 Introduction to Computing with FORTRAN **3 s.h.**
Basic concepts of computer structure and programming techniques, elementary assembly language programming, algorithms, data representations, subprograms, tape and disk usage; major emphasis on programming with FORTRAN. Not open to students who have taken 57:6.

22C:9 Programming with COBOL **3 s.h.**
Use of the business-oriented language COBOL; records, files, and mass storage devices; programming techniques for table handling, sorting, generation of reports from files, and maintenance of sequential and random-access files. Prerequisite: programming experience.

22C:16 Introduction to Programming with Pascal **4 s.h.**
Programming and program design techniques using major portions of the Pascal programming language: simple data types; variables and expressions; program modularization through procedures and functions; block structure; control statements for repetition and selection; data representation; structured data types including arrays, strings, files, records, and sets; application examples including searching and sorting algorithms.

22C:17 Programming Techniques and Data Structures **3 s.h.**
Continuation of 22C:16; complex and dynamically allocated data structures such as lists, queues, stacks, trees, and files; application of software engineering principles to the design and implementation of programs; recursion; comparison of data structure implementations; sorting and searching algorithms; analysis of program efficiency and verification. Prerequisite: grade of C- or higher in 22C:16.

22C:18 Computer Organization and Assembly Language Programming **4 s.h.**
Introduction to hardware organization; memory addressing and structure; CPU-memory-I/O relationships; machine language versus assembly language; assembly, loading, execution; data, data structure representations, limitations, conversions; arithmetic, character processing; condition tests, branches; control structures; subroutines and external linkage, parameter passage; macros; I/O. Prerequisite: grade of C- or higher in 22C:17.

22C:19 Discrete Structures I **3 s.h.**
Propositional and predicate logic, proof techniques with emphasis on induction; sets, functions, relations; graph theory, trees; combinatorics, analysis of algorithms; program correctness. Prerequisite: grade of C- or higher in 22M:25 or 22M:35 or 22M:45, 22C:17, and 22C:18; 22C:18 may be taken concurrently with 22C:19.

22C:21 Algorithms and Data Structures **3 s.h.**
Analysis of algorithms and relation to implementing data structures; sorting and searching, including AVL-trees, B-trees, and hashing; graph algorithms including depth-first and breadth-first search and shortest path; string, array, and matrix representations; dynamic storage management techniques and garbage collection. Prerequisite: grade of C- or higher in 22C:17, 22C:18, and 22C:19.

22C:23 Programming Language Concepts **3 s.h.**
Syntax specification and informal semantic models for programming languages; program control structures including recursion, coroutines, backtracking, and concurrency; data abstraction and structuring methods; introduction to functional and logic programming; examples and projects may rely on several languages—Pascal, Ada, Modula2, Prolog, LISP, and SNOBOL. Prerequisite: grade of C- or higher in 22C:17, 22C:18, and 22C:19.

22C:31 Digital Systems and Computers **3 s.h.**
Basic hardware components: gates, flip-flops, decoders, multiplexers, registers; register operation; arithmetic, logical units and algorithms; memory systems; secondary devices; addressing and instruction types; control units; I/O organizations: direct memory access, I/O interrupt, I/O architectures; case studies of a minicomputer and a microcomputer. Prerequisite: grade of C- or higher in 22C:18.

22C:32 Introduction to Systems Software **3 s.h.**
Introduction to system programming concepts; structure of language processors using examples from assemblers, macro processors, linkers, and loaders; job control languages, sequential and random-access device management, file systems, storage allocation; concurrent programming, scheduling, resource sharing, and protection. Prerequisite: grade of C- or higher in 22C:17, 22C:19, and 22C:31.

22C:51 Computer Graphics **3 s.h.**
Introduction to graphics hardware; design of human-graphic interface; coordinate systems; windowing; clipping; viewports; scaling; translation; rotation; three-dimensional representations; projections from three dimensions to two dimensions; hidden lines and surfaces; vector/raster conversions; reflection and shading; color; animation. Prerequisite: grade of C- or higher in 22C:17 and 22M:27.

22C:55 Elementary Numerical Analysis **3 s.h.**
Numerical solution of polynomials and general algebraic equations; numerical solution of simultaneous linear equations and matrix operations; least squares curve-fitting techniques; interpolation polynomials; numerical solution of ordinary differential equations; detailed error analysis of several techniques; illustrative programming projects. Prerequisite: grade of C- or higher in 22M:26 or 22M:36 or 22M:46, and programming experience. Same as 22M:72.

22C:59 Discrete Structures II **3 s.h.**
Program correctness, inductive assertions, verification conditions; groups and semigroups, homomorphisms, congruences, normal subgroups; partial orders, lattices, completeness, fixed points; Boolean algebras, representation theorem; recurrences, generating functions; finite automata, nondeterminism, regular expressions and languages, state minimization. Prerequisite: grade of C- or higher in 22C:19 and 22M:27.

22C:96 Topics in Computer Science **arr.**
Topics chosen by the instructor to complement material covered in other courses. May be repeated. Consent of instructor required.

22C:99 Honors in Computer Science **arr.**
Individualized work on honors projects. Open only to computer science majors in the honors program. May be repeated. Consent of instructor required.

Graduate Service Courses

22C:100 Introduction to Computing with FORTRAN **2 s.h.**
See 22C:7. Not open to undergraduates or computer science majors for degree credit. Not open to students who have taken 57:6.

22C:102 Computer Literacy **arr.**
Experimental course allowing the use of different media

presentations for learning; goal is to increase knowledge in computer uses and misuses. Not open to computer science majors for degree credit. Consent of instructor required.

22C:106 Introduction to Programming with Pascal **3 s.h.**
See 22C:16. Not open to undergraduates or computer science majors for degree credit.

22C:107 Programming Techniques and Data Structures **2 s.h.**
Continuation of 22C:106; see 22C:17. Not open to undergraduates or computer science majors for degree credit. Prerequisite: grade of C- or higher in 22C:106.

22C:108 Computer Organization and Assembly Language Programming **3 s.h.**
See 22C:18. Not open to undergraduates or computer science majors for degree credit. Prerequisite: grade of C- or higher in 22C:107.

22C:109 Programming with COBOL **2 s.h.**
See 22C:9. Not open to undergraduates or computer science majors for degree credit. Prerequisite: programming experience.

Primarily for Computer Science Majors

22C:115 Software Engineering I **3 s.h.**
Software design and development methodologies; problem analysis, requirements definition, specification, design, implementation, testing/maintenance; formal techniques; human engineering; management and technical/business communication; includes a group practicum experience. Prerequisite: grade of C- or higher in 22C:19, 22C:23, 22C:21, and 22C:32; or consent of instructor.

22C:116 Operating Systems and Concurrent Programming **3 s.h.**
Sequential process and concurrent program concepts and their application to operating system design; sychronization constructs: monitors, conditional critical regions, and semaphores; resource concepts and resource allocation; dynamic protection and operating system structure. Prerequisite: grade of C- or higher in 22C:19, 22C:21, 22C:23, and 22C:32; or consent of instructor.

22C:120 Software Engineering II **3 s.h.**
Continuation of 22C:115; emphasis on group project experience. Prerequisite: grade of C- or higher in 22C:115 or consent of instructor.

22C:122 Advanced Computer Organization and Architecture **3 s.h.**
Processor architectures—Von Neumann machines, array and vector processors, other multiprocessor systems; instruction set design—RISC and CISC; storage systems—cache, main and secondary memory, virtual memory, interleaving, interconnection networks; CPU design—instruction and arithmetic pipelines, microprogramming, I/O organizations; examples from historic and current architectures. Prerequisite: grade of C- or higher in 22C:31 and 22C:32.

22C:123 Programming Language Foundations **3 s.h.**
Formal specification of the semantics of conventional programming languages using a variety of models including attribute grammars, interpreters, axiomatic and denotational techniques; proofs of program correctness and termination; operational and denotational models of logic programming. Prerequisite: grade of C- or higher in 22C:19, 22C:21, and 22C:23.

22C:125 Data: Abstractions, Types, and Structures **3 s.h.**
Data type and data structure specification, including graph theoretic and axiomatic models, but emphasizing algebraic techniques; testing and verification of specifications; data abstraction facilities in modern programming languages; examples and associated algorithms. Prerequisite: grade of C- or higher in 22C:19, 22C:21, and 22C:23.

22C:127 Introduction to Compiler Construction **3 s.h.**
Syntax and semantic analysis of source and target language, phases of a compiler; simple one-pass compiler; lexical analysis—token specification and recognition, automatic scanner generation; syntax analysis—context free grammars, top-down, bottom-up, and operator precedence parsing, LL- and LR-parser techniques, treating ambiguous grammars, error recovery; intermediate code generation—postfix notation, three-address code, syntax trees; code optimization—local, global, loop; large programming project. Prerequisite: grade of C- or higher in 22C:19, 22C:21, 22C:23, and 22C:32.

22C:132 Parallel Programming **3 s.h.**
Parallel algorithms; concept and design, implementation problems, performance evaluation; topics include concept of a process, parallel computations, language and architectural supports; development and running of parallel programs on available parallel machines. Prerequisite: grade of C- or higher in 22C:32 or consent of instructor.

22C:135 Introduction to Computation Theory **3 s.h.**
Finite automata; regular sets and expressions; context free grammars and their properties; finite-state, push-down, linear-bounded, and Turing acceptors; relationships between formal languages and automata; undecidability and its consequences. Prerequisite: grade of C- or higher in 22C:19.

22C:144 Database Management Systems **3 s.h.**
Database management system architecture and models, entity-relationship model, storage representations, access methods, relational calculus and algebra, integrity constraints, decomposition to normal forms; projects using a database management system; topics from query optimization, concurrency, recovery, security, distributed systems. Prerequisite: grade of C- or higher in 22C:19, 22C:21, and 22C:32.

22C:145 Artificial Intelligence I **3 s.h.**
Basic concepts: problem-solving methods, state space representations, heuristic search, problem-reduction techniques, machine inference, game playing; knowledge representations; overviews of expert systems and language processing systems; machine perception. Prerequisite: grade of C- or higher in 22C:19, 22C:23, and 22C:21.

22C:146 Computer Vision and Robotics **3 s.h.**
Vision—edge detection, determining optical flow and shape, image segmentation, pattern recognition, model-directed scene analysis; robotics—hardware (sensors, grippers, manipulators), knowledge representations, movement planning, integration with vision systems; emphasis on AI aspects of robotics. Prerequisite: grade of C- or higher in 22C:19, 22C:23, 22C:21, and 22M:27.

22C:153 Design and Analysis of Algorithms I **3 s.h.**
Correctness of iterative and recursive algorithms; design techniques such as divide-and-conquer and backtracking; analysis techniques such as recurrence equations and amortized complexity; NP-complete problems and Cook's theorem. Prerequisite: grade of C- or higher in 22C:19 and 22C:21.

22C:167 Theory of Graphs **3 s.h.**
Connectivity properties, including Euler and Hamilton cycle problems; characterization of several families of graphs, such as trees and planar graphs; algorithms for such aspects as strong components and isomorphism. Prerequisite: grade of C- or higher in 22C:19. Same as 22M:152.

22C:178 Computer Communications **3 s.h.**
Computer networks, ISO model, network topology, physical networks, data link control; errors and error control; point-to-point networks, broadcast networks, local networks; protocols; transmission and multiplexing; security and privacy. Prerequisites: senior standing in electrical and computer engineering or computer science; 22S:39 or 22S:120. Same as 55:134.

22C:191 Research for Thesis **arr.**
For M.S. candidates in computer science. Consent of adviser required.

22C:195 Topics in Software Engineering **arr.**
Formal treatment of issues such as requirements analysis/modeling, specification, design, software reusability, implementation tools and techniques, programming support environments, testing theory, and management. Consent of instructor required.

22C:196 Topics in Computer Science **arr.**
Topics chosen by the instructor to complement material covered in other courses. May be repeated. Consent of instructor required.

22C:197 Readings in Computer Science **arr.**
Individualized study of material not covered in other courses. May be repeated. Consent of instructor required.

22C:198 Individual Programming Projects **arr.**
Supervised by faculty, offered by arrangement with individual students. May be repeated up to three times.

Primarily for Graduates

22C:216 Advanced Operating Systems **3 s.h.**
Dynamic protection concepts and mechanisms; capabilities, capability addressing and memory protection, file protection; protection system models and principles; virtual machine concept and principles; security kernels; fault tolerant systems; current operating system design issues and case studies. Prerequisite: 22C:116.

22C:217 Topics in Programming Language Design and Implementation **3 s.h.**
Advanced topics in programming languages, such as comparison and evaluation of programming language design, formal semantics and specification techniques, compiler specification, programming and runtime environments, type computations, code generation, code optimization. Prerequisites: 22C:123 and 22C:127.

22C:231 Advanced Theory of Computation **3 s.h.**
Partial recursive, recursive, and primitive recursive functions; recursive and recursively enumerable sets; universal machines; noncomputability results, the recursion theorem, complexity measures, speed-up, limited halting problem. Prerequisite: 22C:135.

22C:234 Topics in the Complexity of Algorithms **3 s.h.**
Information-theoretic lower bounds, polynomial completeness, problems requiring exponential time, space complexity, unprovable properties of computations. Prerequisites: 22C:135 and 22C:153.

22C:244 Topics in Database Management Systems **3 s.h.**
Advanced topics in database management systems, including semantics and modeling, functional and multivalued dependencies, language interfaces, query optimization, recovery, security, concurrency, distributed systems, database machines, performance evaluation. Prerequisite: 22C:144.

22C:245 Artificial Intelligence II **3 s.h.**
Advanced topics in machine intelligence, such as theorem proving, concept formation, AI programming languages and concepts, machine understanding, robot models, philosophies of machine intelligence. Prerequisite: 22C:145.

22C:247 Theory of Program Schemata **3 s.h.**
Program schemata, equivalence, termination, freedom, and decision problems; recursive schemata; data structure modeling; parallel schemata; proving properties of programs. Prerequisites: 22C:135 and 22C:123.

22C:253 Design and Analysis of Algorithms II **3 s.h.**
Approximation algorithms and heuristics; examples of polynomial complete problems; probabilistic algorithms; average-case behavior; parallel algorithms; self-adjusting data structures and amortized complexity. Prerequisites: 22C:153, and either 22S:120 or consent of instructor.

22C:257 Formal Languages **3 s.h.**
Characterization, decision problems, closure properties and operations of phrase-structure, context-sensitive, context-free, and linear languages; finite automata, pushdown stack, linear-bounded, and Turing machine acceptors; abstract families of languages; label languages and control grammars. Prerequisite: 22C:135.

22C:290 Readings for Research **arr.**
Advanced topics approved by adviser; for Ph.D. candidates in computer science. Consent of instructor required.

22C:292 Seminar on Database Systems **arr.**
Consent of instructor required.

22C:293 Seminar on Software Engineering **arr.**
Consent of instructor required.

22C:294 Seminar on Systems and Networks **arr.**
Consent of instructor required.

22C:295 Seminar on Artificial Intelligence **arr.**
Consent of instructor required.

22C:296 Seminar on Computer Science **arr.**
Consent of instructor required.

22C:298 Seminar on Programming Languages **arr.**
Consent of instructor required.

22C:299 Research for Dissertation **arr.**
For Ph.D. candidates in computer science. Consent of adviser required.

MATHEMATICS

Chair: William A. Kirk
Professors: Daniel D. Anderson, Kendall E. Atkinson, Thomas Branson, Nguyen P. Cac, Victor P. Camillo, Raul Curto, Kent R. Fuller, Juan Gatica, Fred Goodman, Herbert W. Hethcote, Eugene W. Johnson, Norman L. Johnson, Palle Jorgensen, Surjit S. Khurana, William A. Kirk, Erwin Kleinfeld, William H. Klink, Frank J. Kosier, Philip C. Kutzko, Bor-Luh Lin, Eugene W. Madison, Paul S. Muhly, George C. Nelson, Robert H. Oehmke, Florian Potra, Richard Randell, Harold L. Schoen, Jonathan K. Simon, Keith D. Stroyan, Tuong Ton-That, Marilyn J. Zweng
Professor emeritus: Edwin Oberg
Associate professors: Hyeong In Choi, Oguz Durumeric, Charles Frohman, Michael A. Geraghty, Margaret Kleinfeld, John P. Lediaev, David Manderscheid, Dennis M. Roseman, Friedmar Schulz, Gerhard Strohmer
Assistant professors: Richard Baker, Kathleen O'Hara, George Paulik, Walter Seaman, Ezio Venturino, Yangbo Ye
Assistant professor emerita: Matilde Macagno
Undergraduate degrees offered: B.A., B.S. in Mathematics
Graduate degrees offered: M.S., Ph.D. in Mathematics

Mathematics is a basic tool for understanding modern society as well as a crucial requirement for many careers in science, engineering, business, and the professions. Research in this living, dynamic subject is at the highest level in history.

Undergraduate Programs

The major in mathematics is designed around a core requirement of courses in calculus, linear algebra, and basic analysis and group theory. Other courses applicable to the major include higher level courses in pure or applied mathematics as well as specific courses in statistics or computer science. Students are encouraged to pursue interests in the many fields in which mathematics is useful, including natural and social sciences and business.

An undergraduate degree in mathematics prepares students for a variety of careers in government and business, for secondary teaching, for graduate study, and with proper planning, for a variety of professional programs. Graduate study is advisable for some industrial and governmental positions and for college and university teaching and research.

Handbooks for majors are available in the mathematics department office. They contain useful, detailed information about schedule planning and career options.

Bachelor of Arts

Students seeking a B.A. degree in mathematics must satisfy the requirements of either program A or program B below. Program A is intended for students who foresee working in industry, government, or business or who plan to pursue graduate study in mathematics. Program B is intended primarily for students seeking secondary school teaching certification. Some restrictions apply in both programs.

Program A Requirements

22M:25-26 Calculus I-II 8 s.h.
or
22M:35-36 Engineering Calculus I-II
or
22M:45-46 Accelerated Calculus I-II
(Advanced placement credit is accepted for all or part of this requirement.)

22M:27 Introduction to Linear Algebra 4 s.h.
22M:28 Calculus III 4 s.h.
22M:100 Introduction to Ordinary Differential Equations 3 s.h.
22M:50 Elements of Group Theory 3 s.h.
22M:55 Fundamental Properties of Spaces and Functions 3 s.h.
Higher level courses may be substituted for the above, if approved by the Department of Mathematics.

Four additional semester-long, upper-level courses in mathematics exclusive of 22M:81, 22M:104, or 22M:195. 12-13 s.h.
The computer laboratory sequence 22M:30-32 may count as one of these courses. The following computer science and statistics courses also may be used to fulfill this requirement.

22C:16 Introduction to Programming with Pascal 4 s.h.
22C:17 Programming Techniques and Data Structures 3 s.h.
22C:21 Algorithms and Data Structures 3 s.h.
22C:135 Introduction to Computation Theory 3 s.h.
22C:153 Design and Analysis of Algorithms I 3 s.h.
22S:125 Actuarial Mathematics I 3 s.h.
22S:126 Actuarial Mathematics II 3 s.h.
22S:133 Quality Control and Engineering Statistics 3 s.h.
22S:152 Regression Analysis 3 s.h.
22S:153 Introduction to Probability 3 s.h.
22S:154 Introduction to Mathematical Statistics 3 s.h.
22S:156 Applied Time Series Analysis 3 s.h.
22S:164 Introduction to Discrete Probability Models 3 s.h.
22S:167 Introduction to Stochastic Processes 3 s.h.

Total 37-38 s.h.

Restrictions

The program must include a two-semester sequence from the following list.

22M:100/140 Introduction to Ordinary Differential Equations/Continuous Mathematical Models

22M:100/142 Introduction to Ordinary Differential Equations/Intermediate Differential Equations

22M:100/144 Introduction to Ordinary Differential Equations/Introduction to Partial Differential Equations I

22M:115/116 Introduction to Analysis I-II

22M:120/121 Abstract Algebra I-II

22M:27/127 Introduction to Linear Algebra/Matrix Theory

22M:123/124 Foundations of Set Theory/Foundations of Logic

22M:28/160 Calculus III/Introduction to Differential Geometry I

22M:118/119 Complex Variables/Complex Variables: Applications

22M:50/120 Elements of Group Theory/Abstract Algebra I

22M:70/198 Foundations of Geometry/Workshop in Mathematics

22S:153/154 Introduction to Probability/Introduction to Mathematical Statistics

22S:153/167 Introduction to Probability/Introduction to Stochastic Processes

Or any two courses selected from one of the following groups.

22M:72/170/171 Elementary Numerical Analysis/Numerical Analysis: Equations and Approximation Theory/Numerical Analysis: Differential Equations and Linear Algebra

22M:90/151/152 Elementary Combinatorics/Discrete Mathematical Models/Theory of Graphs

22M:55/130/132/136 Fundamental Properties of Spaces and Functions/Elementary Topology I/General Topology/Topics in Topology

Capable students are encouraged, with the approval of their advisers, to substitute higher level courses in the same area for any of these requirements. The student handbook offers further advice on the selection of courses.

Program B Requirements

This program is intended primarily for students seeking secondary school teaching certification. See "Secondary Education" in the "College of Education" section of the *Catalog*.

22M:25-26 Calculus I-II 8 s.h.
or
22M:35-36 Engineering Calculus I-II
or
22M:45-46 Accelerated Calculus I-II
(Advanced placement credit is accepted for all or part of this requirement.)

22M:27 Introduction to Linear Algebra 4 s.h.
22M:28 Calculus III 4 s.h.
22M:50 Elements of Group Theory 3 s.h.
22M:55 Fundamental Properties of Spaces and Functions 3 s.h.
22M:70 Foundations of Geometry 3 s.h.
22C:16 Introduction to Programming with Pascal 4 s.h.

22S:120 Probability and Statistics 4 s.h.
or
22S:153 Introduction to Probability 3 s.h.
and
22S:154 Introduction to Mathematical Statistics 3 s.h.

22M:90 Introduction to Discrete Mathematics 3 s.h.
or
22M:151 Discrete Mathematical Models
or
22M:152 Theory of Graphs

One additional upper-level course in mathematics, exclusive of 22M:81 and 22M:195 3 s.h.

Recommended additional courses include but are not limited to:

22M:72 Elementary Numerical Analysis 3 s.h.
22M:90 Introduction to Discrete Mathematics 3 s.h.
22M:107 History of Mathematics 3 s.h.
22M:151 Discrete Mathematical Models 3 s.h.
22M:152 Theory of Graphs 3 s.h.

The following computer science and statistics courses also may be used to fulfill this requirement.
22C:17 Programming Techniques and Data Structures 3 s.h.
22C:21 Algorithms and Data Structures 3 s.h.
22C:135 Introduction to Computation Theory 3 s.h.
22C:153 Design and Analysis of Algorithms I 3 s.h.
22S:152 Regression Analysis 3 s.h.
22S:153 Introduction to Probability 3 s.h.
22S:154 Introduction to Mathematical Statistics 3 s.h.
22S:156 Applied Time Series Analysis 3 s.h.
22S:164 Introduction to Discrete Probability Models 3 s.h.
22S:167 Introduction to Stochastic Processes 3 s.h.

Total 39-41 s.h.

Bachelor of Science

Program A Requirements

Program A requirements for the B.S. degree are the same as those for the B.A. program A, except that two additional courses in mathematics numbered 22M:107 or higher, excluding 22M:195, are required. The following computer science and statistics courses also may be used to fulfill this requirement.

22C:135 Introduction to Computation Theory 3 s.h.
22C:153 Design and Analysis of Algorithms I 3 s.h.
22S:152 Regression Analysis 3 s.h.
22S:153 Introduction to Probability 3 s.h.
22S:154 Introduction to Mathematical Statistics 3 s.h.
22S:156 Applied Time Series Analysis 3 s.h.
22S:164 Introduction to Discrete Probability Models 3 s.h.
22S:167 Introduction to Stochastic Processes 3 s.h.

Program B Requirements

Program B requirements for the B.S. degree are the same as those for the B.A. program B, except that two additional courses in mathematics numbered 22M:107 or higher are required. The statistics and computer science courses listed in the program A requirements for the B.S. degree also may be used to fulfill this requirement.

General Education Requirements

Candidates must satisfy the College of Liberal Arts General Education Requirements and are encouraged to select GER courses that use mathematics.

Other Requirements

Additional degree requirements concerning transfer credit, grade-point average, and so forth, are discussed in the "College of Liberal Arts" section of the *Catalog*.

At least 15 semester hours of post-calculus courses applied toward the major requirements must be taken at The University of Iowa.

Double Major in the Division of Mathematical Sciences

Students wishing to combine a degree in mathematics with one in computer science, statistics, or actuarial science must satisfy the requirements of program A or program B. Both degrees must be the same—B.A. *or* B.S. The College of Liberal Arts requires that students seeking a mathematics double major must earn a minimum of 56 semester hours in courses taken outside the division.

Minor

The minor in mathematics requires:

A minimum of 15 semester hours credit earned in Department of Mathematics courses; at least 12 of these 15 semester hours must be taken at The University of Iowa in advanced courses; neither transfer credit nor credit by examination is accepted toward the 12 semester hours of advanced work; advanced courses are 22M:27, 22M:28, and all courses numbered 22M:50 or higher except 22M:81, 22M:104, and 22M:195;

A grade-point average of at least 2.00 in all work attempted in the Department of Mathematics.

No course counted toward the minor may be taken pass/nonpass.

Honors

Any undergraduate student with a cumulative grade-point average of 3.20 or higher may join the College of Liberal Arts Honors Program; interested students should contact the honors office in the Shambaugh House Honors Center. In order to graduate with honors in mathematics, a student must be registered in the College of Liberal Arts Honors Program, must complete the regular requirements for an undergraduate major in mathematics with a grade-point average of at least 3.40, and must complete either an honors project or suitable approved advanced course work. A student planning to do an honors project is responsible for finding a faculty member willing to supervise the project. Students typically register for 22M:197 for at least 3 semester hours. For more information, contact the Mathematics Department honors adviser.

Graduate Programs

Master of Science

Students earn the M.S. through courses and comprehensive examinations. There is no M.S. thesis.

There are four programs leading to a M.S. degree in mathematics. The requirements (courses and comprehensive examination areas) may be modified with the consent of the department.

Program I

This program prepares students for further study of pure and applied mathematics and for employment in government and industry. Students must take a two-semester sequence in analysis (either 22M:115-116 or 22M:210-211); a course in topology (22M:132); and a two-semester sequence in abstract algebra (either 22M:120-121 or 22M:205-206). The student must take two comprehensive examinations, one on the analysis and topology sequence and the other on the algebra sequence.

The program requires a minimum of 30 semester hours of graduate credit, including at least 24 semester hours in the following.

Mathematics

Any courses numbered 22M:110 or higher.

Computer Science

22C:122 Advanced Computer Organization and Architecture
22C:123 Programming Language Foundations
22C:135 Introduction to Computation Theory
22C:145 Artificial Intelligence I
Any courses numbered 22C:200 or higher

Statistics

22S:153 Introduction to Probability
22S:154 Introduction to Mathematical Statistics
22S:167 Introduction to Stochastic Processes
Any courses having any of the above three courses as prerequisites
Any course numbered 22S:200 or higher

Program II

This program is designed for secondary school teachers. The requirements are the same as those in program I or III, except that two mathematics education courses are required. All mathematics courses numbered 22M:100 or higher may be used to satisfy the 24-semester-hour requirement. Students are encouraged to consult with mathematics education faculty when planning their courses of study.

Program III

This program focuses on applied mathematics. It requires several courses and two comprehensive examinations, one on differential equations (22M:144, 22M:142) and one on numerical analysis/optimization (22M:170, 22M:171, 22M:174). The required courses are:

22M:144 Introduction to Partial Differential Equations I
22M:142 Intermediate Differential Equations

22M:140 Continuous Mathematical Models
or
22M:151 Discrete Mathematical Models

22M:174 Optimization Techniques
22M:170 Numerical Analysis: Nonlinear Equations and Approximation Theory
22M:171 Numerical Analysis: Differential Equations and Linear Algebra

Two additional courses from the following:

22M:118 Complex Variables
22M:127 Matrix Theory
22M:140 Continuous Mathematical Models
22M:151 Discrete Mathematical Models
22M:152 Theory of Graphs
22C:116 Operating Systems and Concurrent Programming
22C:153 Design and Analysis of Algorithms I
22S:153 Introduction to Probability
22S:154 Introduction to Mathematical Statistics
22S:167 Introduction to Stochastic Processes

The program requires a minimum of 30 semester hours of graduate credit, including at least 24 semester hours in the Division of Mathematical Sciences. Students who have courses or experience equivalent to the required courses may request substitute electives.

Program IV

This program is designed for nondepartmental students working toward Ph.D. degrees in areas that require mathematical knowledge. The program has no required courses. Course distribution requirements are the same as those for program I.

Students in program IV are considered to have passed the comprehensive examination for the master's degree in mathematics if they have maintained a minimum grade-point average of 3.00 in all mathematics courses taken for the master's degree in mathematics and have successfully completed the Ph.D. comprehensive examination in the chosen area.

Students in program IV are assigned a mathematics adviser, who works with them and their major adviser to plan an appropriate curriculum for the master's degree in mathematics. A suitable program of study should be approved by a mathematics adviser before the student takes the Ph.D. comprehensive examination, and a member of the mathematics faculty should serve on the Ph.D. comprehensive examination committee.

Admission

Admission to a M.S. degree (programs I-III) is based on a combination of undergraduate course work and grades, letters of recommendation, and GRE General Test scores (also TOEFL scores for foreign students). The following guidelines are current although exceptions may be made. Numerical standards are reset every year or two.

- Students must have completed work in an undergraduate mathematics program equivalent to the bachelor's degree offered by the mathematics department. Students whose preparation does not meet this requirement may be admitted conditionally and are asked to take specific courses that cover the deficiency.
- Students must have an undergraduate grade-point average of at least 2.80. Relevance and difficulty of courses are considered when evaluating grades; grades of C or lower in mathematics courses need to be balanced by A grades.
- Students must submit three letters of recommendation to support their applications.
- Students must score at least 630 on the quantitative section of the GRE General Test. Applicants are encouraged to submit scores for the mathematics area examination as well—particularly students who need financial support whose credentials may show weak areas.
- Foreign students are required to demonstrate their competence in English. Normally this is done by scoring at least 550 on the TOEFL.

Doctor of Philosophy

The Ph.D. program places strong emphasis on preparation for research and teaching. The department maintains no division between "pure" and "applicable" mathematics. It cooperates in interdisciplinary doctoral programs with the College of Education and the Program in Applied Mathematical Sciences.

A Ph.D. student in mathematics must satisfy the following requirements for course work (credits and breadth), examinations, foreign language, and the Ph.D. thesis.

- At least 72 semester hours of graduate credit is required and at least three years of graduate residence, including at least one year at The University of Iowa. While there are no individual required courses, several are designated as preparatory for the Ph.D. comprehensive examination (see below). Students should give these high priority.
- To further encourage mathematical breadth, students must earn at least 18 semester hours of graduate credit in regular courses equivalent to or more advanced than the Ph.D. comprehensive examination preparatory courses. The department maintains a list of 200- and 300-level courses that are accepted as well as rules to ensure proper distribution.
- The Ph.D. comprehensive examination consists of three parts, each a three-hour written exam, all taken over a two-week period. The three areas are chosen by the student from the department's list of comprehensive examination areas as follows: at least two of algebra, analysis, logic, and topology; and either one more of the preceding or partial differential equations. For each comprehensive area, there is a two-semester, 200-level course sequence designated as preparatory, although exams may differ from course content. One grade (pass, fail, conditional pass) is given on the whole three-part examination by a committee that usually consists of six faculty members.

Candidates also take an oral final examination on their dissertation material.

Candidates are required to demonstrate reading proficiency in French, German, or Russian by passing a reading test administered by the appropriate language department, earning a grade of B or higher in the second semester of a sequence offered by the appropriate language department, or passing a special examination approved by the mathematics department graduate committee. The demonstration of language competence must take place after the student has enrolled in graduate school.

The most distinctive aspect of a Ph.D. is the thesis. The department expects this to be an original mathematical work comparable in content and writing quality to that found in standard published research journals. The thesis is written under the supervision of a committee chaired by a member of the department's faculty, presumably the student's adviser.

Admission

Admission to the Ph.D. program is based on a combination of undergraduate or graduate course work and grades, letters of recommendation, and Graduate Record Examination scores (also TOEFL scores for foreign students). See the information on admission for the master's programs in this section of the *Catalog*. The department generally requires stronger grades and scores for doctoral admission: undergraduate or graduate grade-point average of at least 3.20, GRE General Test quantitative score of at least 700, TOEFL score of at least 575. Often new graduate students are admitted as master's

candidates even if they intend to go on for a Ph.D. degree.

Courses

Undergraduate: Lower Division

These courses are not open to graduate students except by special arrangement with the department chair.

22M:000 Cooperative Education Internship 0 s.h.

22M:1 Basic Algebra I 3 s.h.
Percents, ratio and proportion, algebraic expressions and operation, simple products, linear and quadratic equations, simultaneous equations, exponents and radicals; emphasis on verbal problems. Course credit does not count toward graduation for students who enroll at the UI for the first time after July 1985.

22M:2 Basic Algebra II 3 s.h.
Algebraic techniques, equations and inequalities, functions and graphs, exponential and logarithmic functions, systems of equations and inequalities. Prerequisite: 22M:1 or one year of high school algebra. Course credit does not count toward graduation for students who enroll at the UI for the first time after July 1986.

22M:3 Basic Geometry 3 s.h.
Angles, triangles, polygons, areas, Pythagorean theorem, similar triangles, circles, loci, related topics. Offered spring semesters. Course credit does not count toward graduation for students who enroll at the UI for the first time after July 1987. Prerequisite: 22M:1 or one more year of high schol algebra.

22M:4 Theory of Arithmetic 3 s.h.
Study of sets, numeration, whole numbers; integers, rational numbers, and number theory. Offered spring semesters. Prerequisite: 22M:1 or equivalent or consent of instructor.

22M:5 Trigonometry 3 s.h.
Trigonometric functions, solutions of right and oblique triangles, complex numbers. Prerequisite: 22M:2, or two years of high school algebra and one year of high school geometry.

22M:10 Finite Mathematics 4 s.h.
Introduction to logic, set theory, linear equations and inequalities, linear programming, matrix algebra, combinatorial probability. GER: quantitative or formal reasoning. Offered fall semesters. Prerequisite: 22M:2 or two and one-half years of high school mathematics.

22M:11 Introduction to Calculus with Applications 4 s.h.
A short course in calculus; introduction to derivatives and integrals with applications. GER: quantitative or formal reasoning. Offered spring semesters. Prerequisite: 22M:2 or equivalent or 22M:10 or two and one-half years of high school mathematics.

22M:15 Mathematics for the Biological Sciences 4 s.h.
Relations, functions, coordinate systems, graphing, polynomials, trigonometric functions, logarithmic, and exponential functions; topics in discrete mathematics and probability; examples and applications chosen from the biological sciences. GER: quantitative or formal reasoning. Prerequisite: 22M:2 or three years of high school mathematics.

22M:16 Calculus for the Biological Sciences 3 s.h.
Differential and integral calculus; topics in differential equations and multivariable calculus; applications to the life sciences. GER: quantitative or formal reasoning. Prerequisite: 22M:15 or three and one-half years of high school mathematics.

22M:17 Quantitative Methods I 4 s.h.
Quantitative methods for treating problems arising in management and economic sciences and related areas; introduction to differential and integral calculus, systems of linear equations, matrix theory. GER: quantitative or formal reasoning. Prerequisite: 22M:2 or a satisfactory score on the basic math proficiency exam.

22M:19 Elementary Functions 3 s.h.
Functions, relations, coordinate systems; properties and graphs of algebraic, trigonometric, logarithmic, exponential functions; inverse trigonometric functions; properties of lines, conic sections. GER: quantitative or formal reasoning. Prerequisite: 22M:5, or two years of high school algebra and one year of high school geometry.

22M:25 Calculus I 4 s.h.
Together, 22M:25 and 22M:26 examine the fundamental concepts, methods, and techniques of single variable differential and integral calculus; topics include differentiation, techniques of integration, series, and applications. GER: quantitative or formal reasoning. Prerequisite: 22M:19; or 22M:2 and 22M:5; or three and one-half years of high school mathematics, including analytic geometry and trigonometry. Recommended: concurrent enrollment in 22M:30.

22M:26 Calculus II 4 s.h.
Continuation of 22M:25. Prerequisite: 22M:25 or 22M:35 or 22M:45. Recommended: concurrent enrollment in 22M:31.

22M:27 Introduction to Linear Algebra 4 s.h.
Vector algebra and geometry of three-dimensional Euclidean space and extensions to n-space and vector spaces; lines and planes, matrices, linear transformations, systems of linear equations, reduction to row echelon form, dimension, rank, determinants, eigenvalues and eigenvectors. Prerequisite: 22M:25 or 22M:35 or 22M:45 or consent of instructor. Recommended: concurrent enrollment in 22M:32.

22M:28 Calculus III 4 s.h.
Multivariable calculus; vector functions, line integrals, total differentials, gradient, implicit functions, coordinate systems, Taylor's expansion, extrema, multiple integrals, vector fields, surface integrals, Stokes's theorem. Prerequisites: 22M:26 or 22M:36 or 22M:46; and 22M:27.

22M:30 Computer Lab for Calculus I 1 s.h.
Use of the computer as an aid to understanding the concepts and techniques of calculus; no programming experience required. Corequisite: 22M:25 or 22M:35 or 22M:45.

22M:31 Computer Lab for Calculus II 1 s.h.
Use of the computer as an aid to understanding the concepts and techniques of calculus; no programming experience required. Corequisite: 22M:26 or 22M:36 or 22M:46.

22M:32 Computer Lab for Linear Algebra 1 s.h.
Use of the computer as an aid to understanding the concepts and techniques of linear algebera; no programming experience required. Corequisite: 22M:27.

22M:35 Engineering Calculus I 4 s.h.
One-variable calculus keyed to engineering program; derivative, curve sketching, word problems, trigonometric derivatives, three-dimensional vector algebra, plane motion; definite integral and applications. GER: quantitative or formal reasoning. Prerequisite: 22M:5 or 22M:19; or three and one-half years of high school mathematics, including an introduction to analytic geometry and trigonometry.

22M:36 Engineering Calculus II 4 s.h.
Further applications of integration, natural log and exponential, formal integration, conics, quadrics, weighted averages, infinite series, vectors, lines and planes in space, vector-valued functions of a single variable. Prerequisite: 22M:35 or 22M:45.

22M:40 Matrix Algebra for Engineers 2 s.h.
Operations on matrices, systems of linear equations in matrix form and their solution by reduction, determinants, matrix products, eigenvalues and eigenvectors, diagonalization by symmetric matrices, vector spaces, linear independence, basis, and dimension. Corequisite: 22M:36.

22M:41 Differential Equations for Engineers 3 s.h.
Methods of solution of first-order differential equations, higher order differential equations, and systems of linear differential equations, including Laplace transforms. Prerequisite: 22M:36 or 22M:26 or 22M:46. Corequisite: 22M:40.

22M:42 Vector Calculus for Engineers 3 s.h.
Vector calculus keyed to the engineering program; directional and partial derivatives, gradients; Taylor's formula, max-min problems, multiple integrals; coordinates; line, surface integrals, vector fields. Prerequisite: 22M:36 or 22M:46.

22M:45 Accelerated Calculus I 4 s.h.
Differential and integral calculus starting at the beginning level of 22M:25 or 22M:35, but intended for students with excellent preparation and ability. GER: quantitative or formal reasoning. Offered fall semesters. Prerequisite: ACT math score above 29 or University of Iowa calculus placement test score above 25.

22M:46 Accelerated Calculus II 4 s.h.
Second-semester differential and integral calculus; continuation of 22M:45, 22M:25, or 22M:35; intended for exceptional students. Offered spring semesters. Prerequisite: 22M:45 or exceptional performance in 22M:25 or 22M:35 with consent of instructor.

Elementary Topics of General Interest

These courses are not open to graduate students except by special arrangement with the department chair.

22M:50 Elements of Group Theory 3 s.h.
Sets, relations, functions, permutation groups, cyclic groups, structure of finitely generated Abelian groups; emphasis on illustrative examples. Prerequisite: 22M:27 and 22M:28, or consent of instructor.

22M:55 Fundamental Properties of Spaces and Functions 3 s.h.
Elementary topological and analytic properties of real numbers; emphasis on development of student's ability to handle definitions, theorems, and proofs. Prerequisites: 22M:26 or 22M:46, and 22M:28 or consent of instructor.

22M:70 Foundations of Geometry 3 s.h.
Axiomatic development of a common foundation for Euclidean and non-Euclidean geometry; constructions of non-Euclidean models and the independence of the parallel postulate. Prerequisite: 22M:26 or 22M:46 or equivalent.

22M:72 Elementary Numerical Analysis 3 s.h.
Numerical methods for roots of equations, integration, solutions of simultaneous linear equations, polynomial approximation, and solutions of ordinary differential equations; illustrative programming projects. Prerequisites: 22M:26 or 22M:36 or 22M:46, and programming experience. Same as 22C:55.

22M:81 Geometry for Elementary Teachers 3 s.h.
A study of points, lines, and planes; measurement, two- and three-dimensional coordinate geometry, transformational geometry and vectors; applications of geometry to solving real world problems. Open only to elementary teaching certificate candidates and certified elementary teachers. Offered spring semesters. Prerequisite: 22M:1 or equivalent.

22M:90 Introduction to Discrete Mathematics 3 s.h.
Basic methods of enumerative combinatorics, inclusion-exclusion and generating functions, applications of group theory (Polya-Burnside theorem), and other topics. Offered fall semesters. Prerequisite: 22M:50.

Undergraduate: Upper Division

22M:100 Introduction to Ordinary Differential Equations 2-3 s.h.
First-order ordinary differential equations; second-order linear differential equations; series solutions; higher order linear and matrix differential equations; existence and uniqueness theorems. Not recommended for students who have taken 22M:41. Prerequisite: 22M:28.

22M:104 Introduction to Matrix Theory 3 s.h.
Matrices, linear transformations, determinants, Hermite form, characteristic roots, applications. No graduate math credit; no undergraduate math credit for students who have credit from 22M:27 or equivalent. Prerequisite: graduate standing or consent of instructor.

22M:107 History of Mathematics 3 s.h.
Selected topics in the history and development of mathematics. Prerequisites: two semesters of calculus and one semester of linear algebra, or consent of instructor.

22M:108 Philosophy of Mathematics 3 s.h.
The role of formalism, intuitionism, logicism, and Platonism in shaping the foundations of mathematics; nature of mathematical existence and truth; Godel's incompleteness theorems; axiom of choice; philosophical differences between various set theories (e.g., Zermelo-Fraenkel, Godel-von Neumann), category theory, other viable foundations of mathematics; relationship between mathematics and science. Prerequisites: two semesters of calculus and 22M:27, or consent of instructor.

22M:109 Classical Analysis I 3 s.h.
Multivariable calculus and vector field theory, optimization

problems, infinite series and sequences, power series, uniform convergence, improper integrals. Prerequisite: three semesters of undergraduate calculus.

22M:110 Classical Analysis II 3 s.h.
Fourier series, expansions in orthogonal functions, and applications to solutions of partial differential equations (e.g., the heat, wave, and Laplace equations); integral equations method (Green's functions). Prerequisite: 22M:109 or consent of instructor.

22M:115 Introduction to Analysis I 3 s.h.
Sets and functions, sequences and series of real numbers; limits, metric spaces, continuous functions, connectedness, completeness, compactness. Prerequisite: 22M:55 or graduate standing or consent of instructor.

22M:116 Introduction to Analysis II 3 s.h.
Riemann integral, fundamental theorems of calculus, elementary functions, Taylor series, sequences and series of functions, uniform convergence, Picard fixed-point theorem, existence of solutions to differential equations, implicit function theorem. Prerequisite: 22M:115.

22M:118 Complex Variables 3 s.h.
Operational course; geometry of complex plane, analytic functions; Cauchy-Goursat theorem and applications; Laurent series, residues, elementary conformal mapping. Prerequisite: 22M:28 or 22M:109.

22M:119 Complex Variables: Applications 3 s.h.
Conformal mapping and integral transforms (Fourier, Laplace, Mellin, Hankel, and related transforms); applications to ordinary and partial differential equations. Prerequisite: 22M:118 or consent of instructor.

22M:120 Abstract Algebra I 3 s.h.
Rings and linear algebra; groups with operators, endomorphism rings, polynomial rings, rings with chain conditions, unique factorization, matrix rings, similarity of matrices, determinants, canonical forms. Prerequisite: 22M:50.

22M:121 Abstract Algebra II 3 s.h.
Continuation of 22M:120. Prerequisite: 22M:120.

22M:123 Foundations of Set Theory 3 s.h.
Develops the theory of sets as used in abstract mathematics; equivalent forms of the axiom of choice, cardinal numbers and their arithmetic, ordinal numbers and transfinite induction. Prerequisite: 22M:50 or 22M:55 or graduate standing or consent of instructor.

22M:124 Foundations of Logic 3 s.h.
Propositional calculus, Boolean algebras, and introduction to axiomatic theories. Prerequisite: 22M:50 or 22M:55 or graduate standing or consent of instructor.

22M:126 Elementary Theory of Numbers 2-3 s.h.
Factorization, congruence, Diophantine equations, law of quadratic reciprocity. Prerequisite: 22M:50 or equivalent.

22M:127 Matrix Theory 3 s.h.
Vector spaces, linear transformations, matrices, equivalence of matrices, eigenvalues and eigenvectors, canonical forms, similarity, orthogonal transformations, bilinear and quadratic forms. Prerequisite: 22M:27 or 22M:40 or 22M:104.

22M:130 Elementary Topology I 3 s.h.
Introduction to topology of Euclidean spaces and manifolds, emphasis on basic sets (disks, spheres, annuli, Cantor sets) in dimensions 1, 2, and 3: continuous maps homeomorphisms and embeddings; connectedness and paths; convergence and compactness; manifolds; homotopy, contractible sets, Brouwer fixed-point theorem, and covering spaces. Prerequisite: 22M:55 or consent of instructor.

22M:132 General Topology 3 s.h.
Basic concepts of general topological spaces and continuous functions: defining topological structures via bases, subspaces, products, quotients, and spaces of functions; compactness, connectedness, countability, and separation properties; Urysohn's Lemma and applications to metrization and extensions of maps; infinite products and the Tychonoff theorem; complete metric spaces; materials on nets, filters, and uniform structures may be included. Prerequisite: 22M:115 or 22M:130 or graduate standing.

22M:136 Topics in Topology 3 s.h.
Introduction to geometric topology; graphs, surfaces, or subsets of three-dimensional space. Prerequisite: 22M:130 or 22M:115 or 22M:55 or consent of instructor.

22M:140 Continuous Mathematical Models 3 s.h.
Building and analyzing mathematical models involving differential equations for specific problems from engineering and the sciences; a modeling project is required of each student. Prerequisite: 22M:100 or consent of instructor.

22M:142 Intermediate Differential Equations 3 s.h.
Nonlinear differential equations with emphasis on the qualitative behavior of solutions; includes approximation, stability, asymptotic behavior, phase plane techniques, Sturm-Liouville boundary value problems, integral equations, functional differential equations. Prerequisite: 22M:100 or equivalent.

22M:144 Introduction to Partial Differential Equations I 2-3 s.h.
Basic concepts and elementary solution methods; first-order equations; linear second-order equations of elliptic, parabolic, and hyperbolic type; separation of variables, Fourier series. Prerequisite: 22M:100 or equivalent.

22M:145 Introduction to Partial Differential Equations II 3 s.h.
Explicit techniques and topics such as Fourier series and expansions, Sturm-Liouville theory, complex variable methods, Fourier and Laplace transforms, approximation methods. Prerequisite: 22M:144 or consent of instructor.

22M:151 Discrete Mathematical Models 3 s.h.
Case history approach to discrete models from various fields (e.g., genetics, psychology, health care, scheduling); construction, interpretation, analysis, simulation, and testing of models; develops the necessary discrete mathematics. Prerequisite: 22M:27 or equivalent.

22M:152 Theory of Graphs 3 s.h.
Same as 22C:167.

22M:160 Introduction to Differential Geometry I 3 s.h.
Introduction to differential geometry; space curves, differentiable manifolds, vector and tensor fields, integration of forms, covariant differentiation, intrinsic geometry of surfaces. Prerequisite: 22M:28 or 22M:109 or 22M:116.

22M:161 Introduction to Differential Geometry II 3 s.h.
More advanced topics in differential geometry; may cover Riemannian geometry, rigidity theorems, minimal surfaces, connections, elementary Lie groups, or relativity. Prerequisite: 22M:160 or consent of instructor.

22M:170 Numerical Analysis: Nonlinear Equations and Approximation Theory 3 s.h.
Root finding for nonlinear equations; polynomial interpolation; polynomial approximation of functions; numerical integration. Prerequisites: 22M:28 or 22M:42 or consent of instructor; and knowledge of computer programming.

22M:171 Numerical Analysis: Differential Equations and Linear Algebra 3 s.h.
Numerical methods for initial value problems for ordinary differential equations; direct and iterative methods for linear systems of equations; eigenvalue problems for matrices. Prerequisites: 22M:28 or 22M:41 or consent of instructor; and knowledge of computer programming.

22M:174 Optimization Techniques 3 s.h.
Basic theory of optimization and use of numerical algorithms in the solution of optimization problems; linear and nonlinear programming, sensitivity analysis, convexity, optimal control theory, dynamic programming, calculus of variations. Prerequisite: 22M:100 or equivalent.

22M:176 Topics in the Numerical Solution of Partial Differential Equations 3 s.h.
Finite difference methods, finite elements, method of lines, integral equation methods, and other topics. Prerequisite: numerical analysis—preferably 22M:170-171—or consent of instructor.

22M:177 Numerical Analysis for Actuaries 3 s.h.
Same as 22S:177.

22M:178 Parallel and Vector Algorithms in Scientific Computing 3 s.h.
Survey of current implementations of basic linear algebra techniques on selected parallel and/or vector machines with applications to the numerical solution of (partial) differential equations; programming experience on the Encore Multimax and Alliant FX/8 machines of the High Speed Computing Facility. Prerequisites: course in parallel programming and 22M:171, or consent of instructor.

22M:195 Current Issues in Mathematics Education 2-3 s.h.
Philosophy and objectives, curricular problems, review and evaluation of current literature, special methods. Consent of instructor required. Same as 7S:235.

22M:196 Topics in Mathematics arr.
Topics chosen at the discretion of the instructor to complement material covered in other departmental course offerings. Consent of instructor required.

22M:197 Individual Study and Honors in Mathematics arr.
Consent of adviser required.

22M:198 Workshop in Math 3 s.h.
Intensive four-week workshop on programming the analytic formulation of geometric transformations (translations, reflections, rotations, and similarities), and the implementation and demonstration of the "motions" of these transformations, using microcomputer graphic capabilities.

22M:199 Readings in Mathematics arr.
Consent of department chair required.

Core Graduate Courses

22M:200 Introduction to Differential Topology 3 s.h.
Introduction to differentiable manifolds and functions: tangent bundle, Morse-Sard theorem, transversality, submanifolds, tubular neighborhoods, normal bundles, vector fields, degree and intersection theory, fixed-point theory, Morse theory. Prerequisite: 22M:132 or equivalent.

22M:201 Introduction to Algebraic Topology 3 s.h.
Basic concepts of algebraic topology, including homotopy, fundamental group and covering spaces, CW and simplicial complexes, simplicial homology, Euler characteristic. Prerequisite: 22M:132 or equivalent.

22M:205 Introduction to Algebra I 3 s.h.
Abstract algebra: semigroups, groups, rings, integral domains, polynomial rings, division rings, fields, vector spaces, matrices, modules over rings, lattices, categories. Prerequisite: 22M:120 or consent of instructor.

22M:206 Introduction to Algebra II 3 s.h.
Continuation of 22M:205, which is prerequisite.

22M:210 Analysis I 3 s.h.
Fundamentals of the theory of functions of a complex variable, including elementary properties and examples of analytic functions, complex integration, analysis of singularities, maximum modulus principle, the Riemann mapping theorem, and harmonic functions. Prerequisite: 22M:115 or equivalent.

22M:211 Analysis II 3 s.h.
Fundamentals of the theory of functions of a real variable, including the Riemann-Stieltjes integral, the Lebesgue integral, the fundamental theorem of calculus, abstract measures and integration, Fubini's theorem, the Radon-Nikodym theorem, the Riesz theorem, and L-p spaces. Prerequisite: 22M:115 or equivalent.

22M:213 Ordinary Differential Equations I 3 s.h.
The sequence 22M:213-214 includes topics such as existence, uniqueness, continuous dependence of solutions to initial value problems, autonomous systems; Poincare-Bendixon theory, linear systems and linearizations, perturbation, stability, periodic solutions, bifurcation, comparison and oscillation theorems, boundary value problems. Prerequisite: 22M:116 or equivalent.

22M:214 Ordinary Differential Equations II 3 s.h.
Continuation of 22M:213.

22M:216 Partial Differential Equations I 3 s.h.
Elliptic equations; potential theory, the maximum principle, a priori estimates, the Dirichlet problem; initial value problem for parabolic equations; hyperbolic equations; Duhamel's principle, the Cauchy problem; nonlinear equations, characteristics, canonical form, first-order systems. Prerequisite: 22M:116 or consent of instructor.

22M:217 Partial Differential Equations II 3 s.h.
Continuation of 22M:216.

22M:220 Introduction to Mathematical Logic I 3 s.h.
Propositional calculus, first-order predicate calculus, Gödel completeness theorem, formal elementary number theory, Gödel incompleteness theorem. Prerequisite: graduate standing or consent of instructor.

22M:221 Introduction to Mathematical Logic II 3 s.h.
Continuation of formal number theory, arithmetic hierarchy, Post theorem, formal recursive functions.

Turing machines, Thu systems, and world problems. Prerequisite: 22M:220.

Primarily for Graduates

22M:226 Algebraic Topology 3 s.h.
Singular homology and cohomology, axioms for homology and cohomology, duality theorems in manifolds, homotopy groups, Hurewicz theorem. Prerequisite: 22M:201 or equivalent.

22M:260 Differential Geometry I 3 s.h.
Differential manifolds and functions, form, connections, curvature, related topics. Consent of instructor required.

22M:261 Differential Geometry II 3 s.h.
Continuation of 22M:260; topics vary. Prerequisite: 22M:260 or consent of instructor.

22M:270 Abstract Numerical Analysis 3 s.h.
Abstract framework for the numerical analysis of integral and differential equations; introduction to Banach and Hilbert spaces; linear and nonlinear operators; Galerkin collocation and other numerical procedures for solving linear and nonlinear equations. Prerequisites: 22M:115-116 and 22M:170-171, or consent of instructor.

22M:303 Topics in Analysis 2-3 s.h.
Selected topics including measure theory, integration, general topology. May be repeated. Consent of instructor required.

22M:305 Topics in Topology 2-3 s.h.
Topics chosen by instructor; may include homotopy theory, topology of 3-manifolds, 4-manifolds, or higher-dimensional manifolds, knotting and embedding problems, fiber bundles and characteristic classes, K-theory, PL manifolds, or infinite-dimensional manifolds. May be repeated. Consent of instructor required.

22M:313 Functional Analysis I 3 s.h.
Locally convex topological vector spaces, Hahn-Banach and Krein-Milman theorems, duality, Banach and Hilbert spaces. Prerequisite: 22M:211.

22M:314 Functional Analysis II 3 s.h.
Banach algebras, spectrum in Banach algebras, representation of Banach algebras, algebras of operators. Prerequisite: 22M:313.

22M:320 Topics in Ordinary Differential Equations 2-3 s.h.
Selected topics in ordinary differential equations. Prerequisite: 22M:213 or consent of instructor.

22M:321 Topics in Applied Mathematics 2-3 s.h.
Application of mathematics to other disciplines; selected topics. Consent of instructor required.

22M:324 Topics in Partial Differential Equations 2-3 s.h.
Selected advanced topics in partial differential equations. Consent of instructor required.

22M:328 Topics in Logic 3 s.h.
Selected topics including the theory of models, recursive functions, sets, or deductions. Prerequisite: 22M:221 or consent of instructor.

22M:330 Topics in Algebra 2-3 s.h.
Selected topics, including algebraic number theory, groups, group representation rings, algebras, ideal theory, lattice theory. Prerequisite: 22M:206 or consent of instructor.

22M:335 Topics in Ring Theory 3 s.h.
Selected topics in the theory of commutative and/or noncommutative rings and their categories of modules. Prerequisite: 22M:206 or consent of instructor.

22M:340 Homological Algebra 3 s.h.
Modules, tensor products, groups of homomorphisms, categories, functors, homology functors, projective and injective modules, derived functors, torsion and extension functors, homological dimension. Prerequisite: 22M:206 or equivalent.

22M:352 Theory of Probability I 3 s.h.
Basic concepts; distribution and characteristic functions; convergence theorems; conditional expectations; stochastic processes. Prerequisite: 22M:211. Same as 22S:264.

22M:371 Topics in Numerical Analysis 3 s.h.
Selected advanced topics in numerical analysis. Prerequisite: 22M:170-171 or consent of instructor.

22M:387 Seminar: Differential Geometry arr.
Consent of instructor required.

22M:388 Seminar in Nonassociative Rings arr.
Consent of instructor required.

22M:389 Seminar: Algebra arr.
Consent of instructor required.

22M:390 Seminar: Operator Theory arr.
Consent of instructor required.

22M:391 Seminar: Logic and Foundations of Mathematics arr.
Consent of instructor required.

22M:392 Seminar: Topology arr.
Consent of instructor required.

22M:393 Seminar: Mathematical Physics arr.
Consent of instructor required.

22M:394 Seminar: Mathematical Biology arr.
Consent of instructor required.

22M:395 Seminar: Analysis arr.
Consent of instructor required.

22M:396 Seminar: Functional Analysis arr.
Consent of instructor required.

22M:397 Seminar: Partial Differential Equations arr.
Consent of instructor required.

22M:398 Seminar: Numerical Analysis arr.
Consent of instructor required.

22M:399 Reading and Research arr.
Consent of adviser required.

STATISTICS AND ACTUARIAL SCIENCE

Chair: Richard Dykstra
Professors: James D. Broffitt, Richard L. Dykstra, Leonard S. Feldt (Psychological and Quantitative Foundations), Robert V. Hogg, Johannes Ledolter, Paul S. Muhly (Mathematics), Tim Robertson, J. Sedransk, Robert F. Woolson (Preventive Medicine and Environmental Health)
Associate professors: Jonathan D. Cryer, Russell V. Lenth, Ralph P. Russo, George G. Woodworth
Associate professor emeritus: John J. Birch
Assistant professors: James A. Calvin, Jacques Carrière, Mark R. Conaway, Marianthi Markatou, Louis Rizzo, James Sconing, Dale Zimmerman
Undergraduate degrees offered: B.S. in Statistics, Actuarial Science
Graduate degrees offered: M.S., Ph.D. in Statistics; M.S. in Quality Management and Productivity

Statisticians and actuaries build mathematical models for processes that involve random quantities so that they may better understand and perhaps control these processes. For example, statisticians help design and analyze controlled experiments and scientific samples for industry, research, and government. Actuaries work in the insurance industry or as consultants dealing with the risk and uncertainty of potential financial losses. Statisticians and actuaries serve in academic institutions not only in statistical teaching and research but in medicine, social sciences, engineering, education, and other fields where modern research techniques are applicable.

Undergraduate Programs

Bachelor of Science

The Bachelor of Science degree can be earned by following one of the three programs described here.

Actuarial Science

Due to the increasing popularity of the actuarial science major, students are admitted on a selective basis. Undergraduate students who wish to major in actuarial science must submit an application for admission. Although admission is based on several factors, the primary ones are overall grade-point average and grade-point average in mathematics. Students typically submit the application during their sophomore year, after completing at least 40 semester hours including 22M:25 Calculus I, 22M:26 Calculus II, and 22M:27 Introduction to Linear Algebra.

Students should choose the pre-actuarial science major when they enter the University. Transfer students who have completed 40 semester hours and the equivalents of the courses listed above may apply for admission into the actuarial science program prior to enrolling in the University. Application forms and additional information about selective admissions are available from the Department of Statistics and Actuarial Science.

The actuarial science program prepares students for the actuarial profession. The requirements correspond to the education and examination programs of the principal actuarial organizations. Additional courses are specified to provide students with a general knowledge of related business topics. The required courses in the program are:

22C:7 Introduction to Computing with FORTRAN
or
22C:16 Introduction to Programming with Pascal
or
An approved course in computer programming

22M:25-26 Calculus I-II
or
22M:35-36 Engineering Calculus I-II
or
22M:45-46 Accelerated Calculus I-II

22M:27 Introduction to Linear Algebra
22M:28 Calculus III
*22S:120 Probability and Statistics
22S:153 Introduction to Probability
22S:154 Introduction to Mathematical Statistics
22S:150 Methods of Statistical Inference
22S:125-126 Actuarial Mathematics I-II
22S:177 Numerical Analysis for Actuaries
6E:1 Principles of Microeconomics
6E:2 Principles of Macroeconomics

22S:175-176 Casualty Actuarial Mathematics I-II
or
22S:181-182 Life Actuarial Mathematics I-II

*In exceptional cases, the adviser may grant permission to waive 22S:120; otherwise, it should be completed before 22S:153 is taken.

At least three from the following:

6A:1 Introduction to Financial Accounting
6F:100 Introductory Financial Management
6F:102 General Insurance
6M:100 Introduction to Marketing
6J:47 Introduction to Law
6J:100 Administrative Management

Suggested additional courses:

22S:179 Advanced Casualty Insurance Topics
22S:189 Advanced Life Insurance Topics
6F:121 Property and Liability Insurance
6F:122 Life and Health Insurance
6K:277 Management Science Topics (Operations Research section)

The required and elective courses should be taken in the following order. In order to complete the program in four years, 22S:153 Introduction to Probability must be completed prior to the fall semester of the senior year.

Freshman Year

Fall Semester

22M:25 Calculus I
or
22M:35 Engineering Calculus I
or
22M:45 Accelerated Calculus I

10:1 Rhetoric

Spring Semester

22M:26 Calculus II
or
22M:36 Engineering Calculus II
or
22M:46 Accelerated Calculus II

10:2 Rhetoric

Sophomore Year

Fall Semester

22M:27 Introduction to Linear Algebra
6E:1 Principles of Microeconomics

22C:7 Introduction to Computing with FORTRAN
or
22C:16 Introduction to Programming with Pascal

Spring Semester

22M:28 Calculus III
6E:2 Principles of Macroeconomics
22S:120 Probability and Statistics

Junior Year

Fall Semester

22S:125 Actuarial Mathematics I
22S:153 Introduction to Probability
22S:177 Numerical Analysis for Actuaries
Business requirement

Spring Semester

22S:126 Actuarial Mathematics II
22S:154 Introduction to Mathematical Statistics
22S:150 Methods of Statistical Inference
Business requirement

Senior Year

Fall Semester

22S:175 Casualty Actuarial Mathematics I
and/or
22S:181 Life Actuarial Mathematics I

Business requirement

Spring Semester

22S:176 Casualty Actuarial Mathematics II
and/or
22S:182 Life Actuarial Mathematics II

Applied Statistics

This program is designed to prepare students for careers in applied statistics or for graduate study in applied statistics or other disciplines that incorporate statistical tools. The required courses in the program are:

22C:7 Introduction to Computing with FORTRAN
or
22C:16 Introduction to Programming with Pascal

22M:25-26 Calculus I-II
or
22M:35-36 Engineering Calculus I-II
or
22M:45-46 Accelerated Calculus I-II

22M:27 Introduction to Linear Algebra
22M:28 Calculus III
22S:152 Regression Analysis
22S:153 Introduction to Probability
22S:154 Introduction to Mathematical Statistics
22S:158 Analysis and Design of Experiments I

At least two of the following:

63:163 Introduction to the Design of Sample Surveys
22S:156 Applied Time Series Analysis
22S:161 Application of Multivariate Statistical Techniques
22S:163 Nonparametric Statistical Methods
22S:167 Introduction to Stochastic Processes
22S:168 Analysis and Design of Experiments II

Students in this program are expected to take at least two nonintroductory courses in an area in which statistics is applied, such as geography, business, or science. Students also are expected to learn to use at least one statistical analysis computer package.

Mathematical Statistics

This program is designed to prepare students for graduate study in statistics. The required courses in the program are:

22M:25-26 Calculus I-II
or
22M:35-36 Engineering Calculus I-II
or
22M:45-46 Accelerated Calculus I-II

22M:27 Introduction to Linear Algebra
22M:28 Calculus III
22M:55 Fundamental Properties of Spaces and Functions
22M:115 Introduction to Analysis I
22S:153 Introduction to Probability
22S:154 Introduction to Mathematical Statistics

At least three of the following:

22S:152 Regression Analysis
22S:156 Applied Time Series Analysis
22S:158 Analysis and Design of Experiments I
22S:164 Introduction to Discrete Probability Models
22S:167 Introduction to Stochastic Processes

Students are encouraged to learn at least one computer programming language. They also are encouraged to take courses in areas in which statistics is an important tool, such as economics or psychology, and additional courses in mathematics.

Honors

Qualified undergraduate students may earn their degrees with honors.

To graduate with honors in actuarial science, a student must have a grade-point average of at least 3.33 in all departmental courses numbered 120 and higher, pass certain professional exams, and complete two additional courses or an honors project.

To graduate with honors in statistics, a student must have a grade-point average of at least 3.33 in all departmental courses numbered 120 and higher, complete one 200 level course with a grade of at least B-, and complete an honors project.

More specific information about these requirements is available from the department.

Minor

Students can earn a minor in statistics by taking 15 semester hours in statistics courses, 12 of which must be in courses taken at The University of Iowa numbered 22S:105 and above. Students can earn a minor in actuarial science by completing 15 semester hours in Department of Statistics and Actuarial Science courses, including 22S:125, 22S:126, 22S:153, and 22S:154. For either minor, the grade-point average in department courses must be at least 2.00. An additional 15 semester hours is required for two minors (one in statistics, one in actuarial science).

Graduate Programs

Master of Science

Each M.S. candidate has a committee of four members, which is responsible for recommending action on the candidate's degree. For nonthesis programs, the committee's recommendation usually is based on two written examinations on topics covered in the required courses. For thesis programs, the committee's final recommendation usually is based on an oral defense of the thesis, although it may be based on a single written examination over the topics covered in the candidate's program of study.

With the exception of certain two-course sequences approved by the department, graduate students may not include on their plan of study any course that they also took as an undergraduate student at The University of Iowa. When approved two-course sequences are repeated, the second course of the sequence may appear on the plan of study. At the present time, the only approved two-course sequences are 22S:153-154, 22S:175-176, and 22S:181-182.

The department requires a grade-point average of at least 2.75 for courses that appear on the plan of study. This includes all courses used to meet degree requirements plus additional courses that are relevant to the student's program. Students who choose to earn the M.S. degree with thesis may earn up to 6 semester hours of credit for thesis preparation. Specific course requirements for the M.S. programs are given below.

Actuarial Science

Eleven graduate courses are required. These must include:

22S:153 Introduction to Probability
22S:154 Introduction to Mathematical Statistics
22S:150 Methods of Statistical Inference
22S:125-126 Actuarial Mathematics I-II
22S:177 Numerical Analysis for Actuaries

Four courses from:

*22S:175-176 Casualty Actuarial Mathematics I-II
*22S:181-182 Life Actuarial Mathematics I-II
22S:179 Advanced Casualty Insurance Topics
22S:189 Advanced Life Insurance Topics

At least one of the sequences marked (*) must be included. The eleventh course may be any course in statistics, management science, or finance approved by the adviser.

Theoretical Statistics and Probability

22M:115 Introduction to Analysis I
22S:153 Introduction to Probability
22S:154 Introduction to Mathematical Statistics
22S:167 Introduction to Stochastic Processes
22S:201 Theory of Statistics I

At least two of these:

22S:164 Introduction to Discrete Probability Models
22S:172 Topics in Statistics
22S:202 Theory of Statistics II
22S:230 Introduction to the Theory of Nonparametric Statistics
22S:253-254 Advanced Inference I-II
22S:255 Linear Models
22S:256 Multivariate Analysis
22S:264-265 Theory of Probability I-II

Applied Statistics

Without Thesis

22S:152 Regression Analysis
22S:153 Introduction to Probability
22S:154 Introduction to Mathematical Statistics
22S:158 Analysis and Design of Experiments I
22S:173 Data Analysis

At least two of the following:

22S:156 Applied Time Series Analysis
22S:161 Application of Multivariate Statistical Techniques
22S:168 Analysis and Design of Experiments II

The remainder of the program consists of at least two additional courses numbered 22S:133 or above, and other courses approved by the student's adviser.

Experience in a computer language such as FORTRAN is required. If students satisfy the requirement by taking a course, that course may not be counted toward the M.S. semester-hour requirement.

The applied statistics program is designed to be flexible, so that students may concentrate on an area of application in addition to the required statistics courses. Students should work closely with their advisers in developing programs of study tailored to their specific interests. If the student's interest in a particular applications area is strong, a program in another department may be more appropriate; for example, educational measurement and statistics (education), operations research (industrial and management engineering), and biostatistics (preventive medicine and environmental health).

With Thesis

22S:153 Introduction to Probability
22S:154 Introduction to Mathematical Statistics

At least two of these:

22S:152 Regression Analysis
22S:156 Applied Time Series Analysis
22S:158 Analysis and Design of Experiments I
22S:161 Application of Multivariate Statistical Techniques
22S:168 Analysis and Design of Experiments II

The remainder of the program consists of at least two additional courses numbered 22S:133 or above, and other courses approved by the adviser. With the adviser's approval, courses in other fields related to the thesis may be substituted.

Experience in a computer language such as FORTRAN is required. If students satisfy the requirement by taking a course, that course may not be counted toward the M.S. semester-hour requirement.

The typical thesis is a statistical presentation of the results of a meaningful research project in another field, or a study of the characteristics of a new statistical method. It generally requires 3 semester hours of 22S:191 Individual Study for two semesters.

Quality Management and Productivity

This innovative M.S. program is sponsored by the Departments of Statistics and Actuarial Science in the College of Liberal Arts, Industrial and Management Engineering in the College of Engineering, and Management Sciences in the College of Business Administration. The M.S. program requires 36 semester hours, including at least 27 semester hours in the core, which consists of the following nine courses or reasonable substitutes:

22S:120 Probability and Statistics
or
22S:153-154 Introduction to Probability-Introduction to Mathematical Statistics

6N:276 Operations Research-M.B.A.
56:162 Quality Control and Engineering Statistics
22S:152 Regression Analysis
56:164 Reliability Theory and Practice
6K:284 Production Management
6K:278 Forecasting
22S:158 Analysis and Design of Experiments I

6J:263 Organizational Design, Change, and Transformation
or
56:253 Engineering Administration II

Students also must take at least 2 semester hours of seminar and/or practicum. Students are required to have a grade-point average of at least 3.00 for courses that appear on the plan of study. Outstanding students may write M.S. theses.

Doctor of Philosophy

To satisfy the course requirements for a Ph.D. in statistics, students must successfully complete:

22S:152 Regression Analysis
22S:158 Analysis and Design of Experiments I
22S:167 Introduction to Stochastic Processes
22S:173 Data Analysis
22S:201-202 Theory of Statistics I-II
22S:253 Advanced Inference I
22S:255 Linear Models

22S:264 Theory of Probability I
22S:265 Theory of Probability II

At least 2 semester hours of any combination of the following:

22S:291 Seminar: Mathematical Statistics
22S:293 Seminar: Probability
22S:295 Seminar: Applied Statistics

At least one of the following:

22S:156 Applied Time Series Analysis
22S:161 Application of Multivariate Statistical Techniques
22S:168 Analysis and Design of Experiments II

At least one of the following:

22S:220 Analysis of Categorical Data
22S:230 Introduction to the Theory of Nonparametric Statistics

And at least one of the following:

22S:254 Advanced Inference II
22S:256 Multivariate Analysis

The department requires a grade-point average of at least 3.40 for courses that appear on the plan of study. In addition, a grade-point average of at least 3.50 is required on courses used to fulfill the above requirements. Where the requirements state that a certain number of courses be selected from a list, the student may choose which courses are to be used in the grade-point average calculation.

Well-prepared students entering with a B.S. degree require three years of course work to complete the doctoral program; they take 22S:201 and 22S:202 in the first year. Less well-prepared students need to take 22S:153, 22S:154, 22M:115, and 22M:116 in the first year, adding an extra year to the program.

In addition to the above requirements, for each semester graduate students are registered for 6 or more semester hours, their registration must include at least one course of at least 2 semester hours offered by the Department of Statistics and Actuarial Science other than 22S:191 Individual Study, 22S:197 Readings in Statistics and/or Actuarial Science, or 22S:299 Reading Research.

During the graduate program, students may take course work or seminars in other departments to achieve certain auxiliary goals of the doctoral degree in statistics. Those goals are to relate an area of specialization to other fields of knowledge, to acquire the ability to use electronic digital computing equipment, or to learn the language skills needed to read foreign scientific journals and be able to respond in personal contacts with foreign statisticians.

Students are required to include in their programs a component that involves experience in either teaching or statistical consulting.

Students who expect to request financial assistance for their third year should take the qualifying examination no later than the spring semester of their second year.

The qualifying examination covers introductory probability, mathematical statistics, and regression analysis. These topics generally are covered in 22S:152, 22S:153, 22S:154, and 22S:158; study guides are available from the department. Students who are unsuccessful in their first attempt may repeat the qualifying examination only one time.

Students take a comprehensive examination after completing most of the course work on their approved plan of study, typically during the third year.

The comprehensive examination consists of a written core examination and an oral examination on statistical inference, linear models, and probability. These topics are generally covered in 22S:201-202, 22S:255, and 22S:264. Study guides for the core examination are available from the department.

A program that does not conform to the prescribed requirements but is of high quality may be approved by the department chair.

Special Features

Because statisticians often are teamed with other scientists in research projects, it is important that students gain experience in group efforts. The department tries to provide this experience in several courses. In addition, the department houses the Statistical Consulting Center, which offers assistance to members of the University community in planning experiments and carrying out the analysis of experimental data. Under faculty supervision, graduate students may participate in these activities as part of their training.

Although the majority of Statistical Consulting Center projects involve statistical problems arising in thesis research conducted by students in other departments, the center also seeks involvement in larger research projects and proposal writing.

Courses

Primarily for Undergraduates

Students may not receive credit for a Department of Statistics and Actuarial Science course numbered below 110 after receiving credit for one numbered above 110. Students may receive credit in only one of these courses: 22S:2, 22S:8, or 22S:25.

22S:2 Statistics and Society **3 s.h.**
Statistical ideas and their relevance in public policy, business, and the social, health, and physical sciences; focus on making students critical consumers of statistical evidence. GER: quantitative or formal reasoning. Prerequisite: 22M:1 or equivalent or consent of instructor.

22S:8 Quantitative Methods II **4 s.h.**
Continuation of 22M:17; descriptive statistics, elementary probability, estimation and testing, regression, and correlation. GER: quantitative or formal reasoning. Prerequisite: 22M:17 or equivalent.

22S:25 Elementary Statistics and Inference **3 s.h.**
Graphing techniques for presenting data, descriptive statistics, correlation, regression, and prediction; logic of statistical inference, elementary probability models, estimation and tests of significance. GER: quantitative or formal reasoning. Prerequisite: 22M:1 or equivalent. Same as 7P:25.

22S:39 Probability and Statistics for the Engineering and Physical Sciences **3 s.h.**
Descriptive statistics, exploratory data analysis, random variables, important discrete and continuous distributions, point and interval estimation, tests of hypotheses, regression, design of experiments including factorial and fractional factorial designs. Prerequisite: 22M:36 or equivalent.

For Undergraduates and Graduates

22S:000 Cooperative Education Internship **0 s.h.**

22S:101 Biostatistics **3 s.h.**
Elementary course on statistical methods primarily for research in health science and related fields; includes descriptive statistics and an introduction to estimation and tests of hypotheses. Prerequisite: 22M:1 or equivalent.

22S:102 Introduction to Statistical Methods **3 s.h.**
Primarily for students who are not statistics majors. Same as 7P:143, 31:143.

22S:105 Geostatistics Seminar **2 s.h.**
Statistical methods useful in the earth sciences: t-tests, chi-square tests, analysis of variance, regression analysis, discriminant analysis, factor analysis, cluster analysis, use of statistical computer packages. Recommended: one semester of statistics. Same as 12:155.

22S:120 Probability and Statistics **4 s.h.**
Finite and general probability models, random variables, functions of random variables, expectations, discrete and continuous distributions, estimation and hypothesis testing, regression. Prerequisite: 22M:26 or 22M:36.

22S:125 Actuarial Mathematics I **3 s.h.**
Advanced mathematics of finance, including annuities certain, amortization schedules, yield rates, sinking funds, and bonds. Offered fall semesters. Prerequisite: 22M:26 or 22M:36 or 22M:46.

22S:126 Actuarial Mathematics II **3 s.h.**
Elements from probability and mathematics of finance developed and applied to problems in determination of net premiums, gross premiums, reserves, and asset shares for both life and casualty insurance. Offered spring semesters. Prerequisite: 22M:26 or 22M:36 or 22M:46. Corequisite: 22S:120.

22S:133 Quality Control and Engineering Statistics **3 s.h.**
Prerequisite: 22S:39. Same as 56:162.

22S:138 Bayesian Statistics I **3 s.h.**
Theory and practice of Bayesian statistical analysis; comparison of Bayesian and classical paradigms; Bayesian version of classical concepts such as confidence intervals, hypothesis tests, sufficiency, and central limit theorem; emphasis on noninformative priors, computational approximations, hierarchical models, and robustness. Prerequisite: 22S:120 or equivalent. Same as 7P:148.

22S:140 Design and Analysis of Experiments in the Biomedical Sciences **3 s.h.**
Prerequisite: 63:161. Same as 63:162.

22S:148 Intermediate Statistical Methods **4 s.h.**
Prerequisite: 22S:102 or equivalent. Same as 7P:243.

22S:150 Methods of Statistical Inference **3 s.h.**
Regression analysis, analysis of variance, time series methods; use of statistical computing packages. Prerequisite: 22S:120 or equivalent.

22S:152 Regression Analysis **3 s.h.**
Analysis of the multiple linear regression model, matrix approach, residual analysis, variable selection, dummy variables, regression diagnostics, use of statistical computer packages. Prerequisite: 22S:120 or equivalent. Same as 56:176.

22S:153 Introduction to Probability **3 s.h.**
Introduction to theory and application of probability models, including elementary combinatorics, random variables, conditioning, independence, moments, generating functions, basic probability models. Prerequisite: 22M:26 or 22M:36.

22S:154 Introduction to Mathematical Statistics 3 s.h.
Sampling distribution theory, point and interval estimation; Bayesian estimation, statistical hypothesis testing including likelihood ratio tests, chi-square goodness of fit tests and simple linear regression. Prerequisites: 22S:153, or 22S:120 and consent of instructor; and multivariate calculus.

22S:156 Applied Time Series Analysis 3 s.h.
General stationary and nonstationary models; autocovariance and autocorrelation functions; stationary and nonstationary autoregressive integrated moving average models; identification, estimation, and forecasting in linear models; use of statistical computer packages. Offered spring semesters. Prerequisites: 22S:152, and 22S:120 or 22S:154.

22S:157 Correlation and Regression 3 s.h.
Prerequisite: 22S:148 or equivalent. Same as 7P:244.

22S:158 Analysis and Design of Experiments I 3 s.h.
Single and multifactor experiments; fixed- and random-effects models; repeated measures designs, two-level factorials and fractions thereof, analysis of covariance; diagnostics; use of statistical computer packages. Offered spring semesters. Prerequisites: 22S:152, and 22S:120 or 22S:154.

22S:159 Design of Experiments 4 s.h.
Prerequisite: 22S:148. Same as 7P:246.

22S:161 Application of Multivariate Statistical Techniques 4 s.h.
MANOVA, discriminant analysis, factor analysis, principal components, canonical analysis, nonmetric scaling, cluster analysis, categorical data analysis, use of multivariate statistical computer packages. Offered fall semesters. Prerequisites: 22S:152 and 22S:158. Same as 7P:245.

22S:163 Nonparametric Statistical Methods 3 s.h.
Selected nonparametric methods; includes one- and two-sample location tests and estimation methods, measures of association and analysis of variance; emphasizes relationship with classical parametric procedures. Prerequisite: 22S:148 or 22S:120 or consent of instructor. Same as 7P:247.

22S:164 Introduction to Discrete Probability Models 3 s.h.
Basic probability theory; random variables; conditional probability and conditional expectation; elementary stochastic processes and applications. Prerequisite: 22S:153 or 22S:120 or equivalent.

22S:167 Introduction to Stochastic Processes 3 s.h.
Theory and application, including Poisson processes, Markov chains, renewal theory, and continuous-time Markov chains. Offered spring semesters. Prerequisite: 22S:153 or 22S:164.

22S:168 Analysis and Design of Experiments II 3 s.h.
Factorial and fractional factorial designs; alias structure; resolution; saturated designs; response surface methods; canonical analysis; ridge analysis; simplex, composite, rotatable, and orthogonal designs; empirical and mechanistic model building; nonlinear models. Prerequisites: 22S:158 and 22S:152, or equivalent.

22S:172 Topics in Statistics 3 s.h.
Consent of instructor required.

22S:173 Data Analysis 3 s.h.
Realistic supervised data analysis experiences, including statistical packages, statistical graphics, writing statistical reports, dealing with complex or messy data. Prerequisites: 22S:152, 22S:158, and experience in one statistical package and one programming language.

22S:175 Casualty Actuarial Mathematics I 3 s.h.
Utility, analysis of individual and collective models, risk theory, ruin theory for compound processes, applications to reinsurance. Offered fall semesters. Prerequisite: 22S:153. Corequisite: 22S:154.

22S:176 Casualty Actuarial Mathematics II 3 s.h.
Application of statistical theory to the development and estimation of loss distributions; truncated and censored data, Bayesian estimation, credibility theory. Offered spring semesters.

22S:177 Numerical Analysis for Actuaries 3 s.h.
Introduction to calculus of finite differences, interpolation, numerical integration, solution of nonlinear equations. Prerequisite: 22M:28. Same as 22M:177.

22S:179 Advanced Casualty Insurance Topics 3 s.h.
Topics selected by instructor for relevance to specific problems in casualty insurance; topics may include loss reserving, classification rate making, individual risk rating, and reinsurance. Consent of instructor required.

22S:181 Life Actuarial Mathematics I 3 s.h.
Stochastic approach to life insurance models using the life table and mathematics of finance; net premiums and reserves for insurance and annuity products. Offered fall semesters. Prerequisites: 22S:126 and 22S:153. Corequisites: 22S:154 and 22S:125.

22S:182 Life Actuarial Mathematics II 3 s.h.
Continuation of 22S:181; multiple-decrement and multi-life models; gross premiums, asset shares; cash values; dividends and cash flow. Offered spring semesters. Prerequisite: 22S:181.

22S:188 Actuarial Exam Preparation 1 s.h.
Problem-solving sessions prepare for examinations given by the Society of Actuaries; separate sections for each examination. May be repeated up to 4 s.h.

22S:189 Advanced Life Insurance Topics 3 s.h.
Topics selected by instructor for relevance to specific problems in life insurance; possible topics include construction of mortality tables, graduation, demography, pension funding, and valuation. Consent of instructor required.

22S:191 Individual Study arr.
For M.S. thesis students. Consent of adviser required.

22S:197 Readings in Statistics and/or Actuarial Science arr.
Consent of instructor required.

Primarily for Graduates

22S:201 Theory of Statistics I 3 s.h.
Modes of convergence, laws of large numbers, central limit theorem, delta-method statistical models, sufficiency, exponential families, methods of estimation, optimality theory, and large sample theory; first graduate-level course in the theory of statistics. Prerequisites: 22M:115-116 and 22S:154.

22S:202 Theory of Statistics II 3 s.h.
Continuation of 22S:201; topics include confidence intervals, hypothesis tests, proportions of tests, p values, power, Neyman-Pearson theory, likelihood ratio tests, large sample theory. Prerequisite: 22S:201.

22S:220 Analysis of Categorical Data 3 s.h.
Introduces concept of log-linear models as a basis for study of categorical data; includes models for discrete data, distribution theory, maximum likelihood and weighted least-squares estimation for cross-classified categorical data, tests of fit, model selection. Prerequisites: 22S:154 and 22S:152, or consent of instructor. Same as 63:262.

22S:230 Introduction to the Theory of Nonparametric Statistics 3 s.h.
Techniques for making tests of hypotheses distribution-free, U-statistics, asymptotic efficiency, nonparametric point and interval estimation. Prerequisite: 22S:201.

22S:253 Advanced Inference I 3 s.h.
Decision theoretic principles, group and exponential families, unbiased estimation, Fisher information and the information inequality, invariance and equivariance principles; MLE, Bayes, and minimax estimation. Prerequisites: 22S:202 and 22M:116.

22S:254 Advanced Inference II 3 s.h.
Continuation of 22S:253; hypothesis testing, large sample theory, asymptotic optimality, asymptotic efficiency, statistical functions, U-, M-, L-, and R-statistics. Prerequisite: 22S:253.

22S:255 Linear Models 4 s.h.
Linear spaces and matrix theory, multivariate normal distribution and distributions of quadratic forms, full-rank and non-full-rank linear models, estimability, interval estimation, hypothesis testing, random and mixed models, and applications. Prerequisites: 22S:154 and 22S:158.

22S:256 Multivariate Analysis 4 s.h.
Multivariate distributions, tests and estimates, multivariate general linear model, MANOVA, discriminant analysis, canonical correlation, factor analysis, principal components, and other topics selected by the instructor. Prerequisite: 22S:255.

22S:264 Theory of Probability I 3 s.h.
Probability spaces, random variables, expectation, integration theorems, probability inequalities, modes of convergence, characteristic functions, independence, sums of random variables, laws of large numbers, central limit theorems, 0-1 laws. Prerequisite: 22M:116. Same as 22M:352.

22S:265 Theory of Probability II 3 s.h.
Continuation of 22S:264; conditional probability and expectation, martingales, stopping rules, weak convergence, Wiener process and measure, Donsker's theorem, and applications. Prerequisite: 22S:264.

22S:272 Topics in Theory of Probability and Statistics arr.
Selected topics in theoretical statistics of the instructor's choice. May be repeated. Consent of instructor required.

22S:291 Seminar: Mathematical Statistics arr.
Consent of instructor required.

22S:293 Seminar: Probability arr.
Consent of instructor required.

22S:295 Seminar: Applied Statistics arr.
Consent of instructor required.

22S:299 Reading Research arr.
Consent of adviser required.

MICROBIOLOGY

Acting Chair: Allen J. Markovetz
Undergraduate degree offered: B.S. in Microbiology
Graduate degrees offered: M.S., Ph.D. in Microbiology

Microbiology is the branch of biology that deals with the smallest living things: bacteria, fungi, algae, protozoa, and viruses. It is coupled with immunology, the study of the response of higher organisms to foreign substances.

Microbiology and immunology are at the forefront of the modern biological revolution. Microbes are often the experimental subjects of choice for examining basic genetic and biological phenomena because of their small size, rapid growth rate, and relative simplicity. A significant fraction of contemporary biochemical research employs microbiological and immunological methods.

Some research areas in which both practical and theoretical advances are occurring include the study and evolution of microbial species pathogenic to animals, plants, and man; the use of recombinant DNA methods to analyze basic biological processes and generate valuable products; the nature and occurrence of microbial life in extreme or unusual environments; microbial synthesis and modification of antibiotics and other natural products; the role of microbes in stabilization of the biosphere by recycling and detoxifying waste products; and the genetics and regulation of the immune response, including selection and culture of hybrid cell lines able to produce antibodies of single type (monoclonal antibodies).

Microbiology is an excellent major for undergraduate students who want a good general education with emphasis on an important and interesting branch of biology. For the graduate with a bachelor's degree in microbiology, positions are available in government, hospitals, public health

laboratories, research laboratories, and industrial laboratories (food, dairy, chemical, pharmaceutical, and genetic engineering companies).

Students who continue beyond the bachelor's degree have career opportunities in these same areas plus college and university teaching, with greater responsibilities and commensurately higher salaries.

Undergraduate Program

Bachelor of Science

Undergraduate students majoring in microbiology at The University of Iowa must meet the General Education Requirements of the College of Liberal Arts. They must complete a minimum of 21 semester hours in microbiology to obtain a B.S. degree. No more than 2 semester hours of 61:161, 61:171, or 61:172, and 1 semester hour of 61:163 Seminar in Microbiology may count toward this requirement.

Students who want to apply for certification by the National Registry of Microbiologists are required to earn 30 semester hours of credit in biology, 20 of which must be in microbiology. Certification is required for employment or advancement in some areas, primarily in diagnostic microbiology.

Students may to take microbiology courses more advanced than 61:157 General Microbiology only if they receive a grade of C or above in 61:157. Mathematics and science courses required by the department for the B.S. degree must be taken for letter grades.

Microbiology Seminar (61:163) should be taken for credit only once during the senior year. Students are encouraged to take the course for 0 semester hours credit during other semesters after they have taken 61:157.

Microbiology majors must take the following courses in addition to required microbiology courses.

4:13 Principles of Chemistry I	3 s.h.
4:14 Principles of Chemistry II	3 s.h.
4:16 Principles of Chemistry Lab I	2 s.h.
4:121 Organic Chemistry I	3 s.h.
4:122 Organic Chemistry II	3 s.h.
4:141 Organic Chemistry Laboratory	3 s.h.
99:120 Biochemistry and Molecular Biology I	4 s.h.
99:130 Biochemistry and Molecular Biology II	4 s.h.
22M:16 Calculus for the Biological Sciences	3 s.h.
or	
22M:25 Calculus I	4 s.h.
or	
22M:35 Engineering Calculus I	4 s.h.
29:11-12 College Physics	8 s.h.
37:3 Principles of Animal Biology	5 s.h.

Recommended courses include the following.

8W:10 Expository Writing	3 s.h.
or	
8W:112 Writing for the Sciences	3 s.h.
22C:7 Introduction to Computing with FORTRAN	3 s.h.
or	
22C:16 Introduction to Programming with Pascal	4 s.h.
and	
22C:17 Programming Techniques and Data Structures	3 s.h.

Honors Program

The honors program is open to juniors and seniors who have a grade-point average of at least 3.20 overall and 3.20 in microbiology courses. The honors program in microbiology requires 25 semester hours of course work in microbiology, including 6 semester hours in 61:171-172 Honors Microbiology. These two courses constitute an introduction to experimental research. At the end of the research, students present a written report. Students who successfully complete these requirements receive the B.S. degree with honors.

Minor

An undergraduate minor in microbiology requires at least 15 semester hours of credit in microbiology courses with a minimum grade-point average of 2.00. Of these 15 semester hours, at least 12 must be taken at The University of Iowa in courses numbered 61:100 and above.

Graduate Programs, Faculty Roster, Courses

See "Microbiology" in the College of Medicine section of the *Catalog*.

MILITARY SCIENCE (ARMY ROTC)

Head: Lieutenant Colonel Perry V. Roberts
Professor: Perry V. Roberts (Lieutenant Colonel)
Assistant professors: Mark A. Coffey (Captain), Richard M. Lampkin (Major), Edward C. Miller (Captain), Steven M. F. Stuban (Captain), John A. Watz (Captain)
Instructors: Michael L. Jackson (SGM), Carey W. Jurin (MSG)

The Military Science Department is a nondegree-producing academic department that administers the Reserve Officers' Training Corps (ROTC) program. The department provides students with education in the role of the military and instruction in personnel leadership while providing those students who desire to serve in the armed forces, on an active or reserve status, an opportunity to earn a commission as an army officer.

Courses are open to all students. The course credit that may be applied toward graduation varies. In the College of Liberal Arts, up to 20 semester hours may be applied toward graduation.

Undergraduate Program

Basic Course

The ROTC basic course is designed primarily for freshmen and sophomores. It provides the fundamentals of leadership and management and introduces the roles of the military as affected by national and foreign policy. Students incur no obligation to the military for participation in the basic course. The following courses satisfy the basic course requirement:

23:91 The Profession of Arms	1 s.h.
23:92 The Military in a Modern Society	1 s.h.
23:93 Military Survival Skills	2 s.h.
23:94 Principles of Modern Warfare	2 s.h.

Students who plan to pursue a commission as an officer should take 23:90 Leadership Laboratory with 23:91. All other basic course classes include a laboratory period. The basic course requirements may be compressed over a one-year period or satisfied by attending a six-week paid camp during the summer. Students with prior military training may be exempt from the basic course requirements.

Advanced Course

The ROTC advanced course, though open to any student who meets the prerequisites, is designed primarily for students who wish to pursue a commission as a lieutenant in the U.S. Army upon graduation. It is open to both undergraduate and graduate students. Most students in the advanced course incur an obligation with the military that can be satisfied in the regular army or the army reserve.

A grant of $100 per month is provided to students who agree to serve in the armed forces. Additional financial assistance may be provided through participation in training with an army reserve unit.

To enter the advanced course, students must satisfy the basic course requirements, be academic sophomores, and have at least a 2.00 grade-point average. A six-week paid camp, normally taken the summer before the senior year, is required for all students wishing to become army officers. The following courses are the academic requirements for completion of the advanced course:

23:95 Advanced Military Fitness Training (taken the same semester with 23:117)	1 s.h.
23:116 Challenges of Leadership	3 s.h.
23:117 Small Unit Tactics	3 s.h.
23:118 Military Management	3 s.h.
23:119 Service Orientation	3 s.h.

Additional Course Work

Students also must complete a course in the following areas through other University departments. These courses may be the same as those used to satisfy the College of Liberal Arts General Education Requirements.

Written communications

Human behavior

Mathematics

Military history

Computer literacy

Financial Aid

The Military Science Department offers two- and three-year merit scholarships for students who wish to enter the ROTC program. These scholarships provide payment of tuition at The University of Iowa, $390 for books and supplies each year, up to $350 in academic fees per year, and a $100-per-month, tax-free subsistence allowance during the academic year. Additional scholarships are available for nursing students who wish to become army nurses.

Courses

23:90 Leadership Laboratory **0 s.h.**
Military skills and application of leadership; focus on improving cadets' abilities to perform as officers. Corequisite: 23:91.

23:91 The Profession of Arms **1 s.h.**
Officership in the military as a profession; organization of the military, basic customs, and traditions; officer branches of the army. Offered fall semesters. Recommended: 23:90.

23:92 The Military in a Modern Society **1 s.h.**
The military and how its global involvement affects foreign policy; NATO and Warsaw Pact organizations; role of strategic balance in ensuring national security; fundamental leadership principles. Offered spring semesters.

23:93 Military Survival Skills **2 s.h.**
Skills required of junior leaders in the U.S. Army; land navigation, basic survival techniques, first aid, communication procedures. Offered fall semesters. Prerequisites: 23:91 and 23:92, or consent of instructor.

23:94 Principles of Modern Warfare **2 s.h.**
Principles of military doctrine and leadership; current issues affecting military operations worldwide, peacetime role of the military, and principles of warfare; leadership assessment and examination of leadership characteristics. Offered spring semesters. Prerequisite: 23:94 or consent of instructor.

23:95 Advanced Military Fitness Training **1 s.h.**
Aerobics and running, muscular strength and endurance, flexibility, and nutrition; exercise and classroom instruction; developed around army physical fitness training program. Graded satisfactory/fail. Offered spring semesters. Corequisite: 23:117 or consent of instructor.

23:99 Fundamentals of Military Organization and Operation **2-4 s.h.**
A composite course containing the essential elements of 23:91, 23:92, 23:93, and 23:94. Offered spring semesters. Consent of instructor required.

23:116 Challenges of Leadership **3 s.h.**
Organizational leadership; emphasis on measuring performance, motivation, delegation of authority, and responsibility; decision making, professional ethics, counseling techniques. Offered fall semesters. Consent of instructor required. Corequisite: fulfillment of basic course requirement.

23:117 Small Unit Tactics **3 s.h.**
Detailed fundamentals of military planning and preparation of military operations orders and tactics; instruction in land navigation, drill and ceremonies, radio communications, and physical training; includes field exercises during weekends. Offered spring semesters. Prerequisite: 23:116 or consent of instructor.

23:118 Military Management **3 s.h.**
Leadership and management in large organizations; analysis of military personnel, logistics, and training systems; military justice system. Offered spring semesters. Prerequisite: 23:117 or consent of instructor.

23:119 Service Orientation **3 s.h.**
Culminating course that integrates all previous leadership instruction in preparation for role as army officer; logistics, personnel administration, training, and professional development. Offered spring semesters. Prerequisite: 23:118 or consent of instructor.

23:121 Readings in Contemporary Military Issues **1-3 s.h.**
Independent studies to meet specific program requirements; research topics based on the student's specific needs and in conjunction with assigned instructor; semester hours based upon research required. May be repeated.

MOLECULAR BIOLOGY

Graduate degree offered: Ph.D. in Molecular Biology

The Molecular Biology Ph.D. Program is an interdepartmental program involving members of the Departments of Biochemistry, Biology, Microbiology, and Physiology and Biophysics as well as a number of faculty members from clinical departments. See "Molecular Biology" in the College of Medicine section of the *Catalog* for a list of participating faculty members, degree requirements, and courses.

MUSEUM TRAINING

Chair and director: George D. Schrimper
Assistant professor: George D. Schrimper
Adjunct instructor: William W. Thomson

Museums collect and use the tangible objects of science, history, and art as resources to provide a framework for discovery, learning, and inspiration. The University of Iowa museum training program offers courses that provide a fundamental background in the history, philosophy, organization, and management of museums; museum functions and operational procedures; and the conceptual, design, and technical aspects of exhibit preparation.

With courses offered continuously since 1910, Iowa's museum program is the oldest of more than 130 university- and college-based curricula in the United States. The museum field is expanding, and Iowa museum program graduates have assumed positions of responsibility as directors, curators, and exhibit specialists in museums throughout the United States and Canada.

A major in one of the natural sciences (biology, geology, or botany), anthropology, science education, art, or history is recommended for students preparing for museum careers. Courses are offered during the annual eight-week summer session as well as during the regular academic year. These elective college courses count as credit toward the B.A. or B.S. degree. An area of specialization (administration, curation, exhibit design and graphics, educational programming) also can be tailored to the student's museum career objective with appropriate elective courses in other departments.

For graduate work, courses may be credited as a formal museology concentration on a master's degree in anthropology or science education, or on a Ph.D. degree in science education. Inquiries regarding program details should be directed to the appropriate major department.

Courses presented in the department are of value not only to students intending to pursue careers in museums but also to those who have specialized interests in the sciences, arts, and humanities. Advanced museum students can gain practical working experience by participating directly in programs of The University of Iowa Museum of Natural History and through formal internships with other museums.

Courses

24:000 Cooperative Education Internship **0 s.h.**

24:102 Museum Technique **2 s.h.**
Collection and preparation of biological materials for museum display, classroom teaching, or repository uses; cataloging and specimen data retrieval. May be repeated.

24:103 Museum Laboratory Methods **2 s.h.**
Techniques used in preparation of science classroom teaching materials and museum exhibit accessories; instruction in various casting, mold-making, and modeling procedures used in replication or preservation of archaeological, geological, zoological, or botanical specimens. May be repeated.

24:104 Museum Laboratory Methods **2 s.h.**
Continuation of 24:103, but may be taken as independent unit. May be repeated.

24:110 Principles of Exhibit Design **2 s.h.**
Conceptual design and execution of museum exhibits and galleries, including planning and drafting; uses of space, objects, composition, and color; graphics, typography; and evaluation strategies; group discussion and field trip. Prerequisite: 24:112 or consent of instructor.

24:112 Introduction to Museology **2 s.h.**
Introductory course encompassing the history, philosophy, operations, and management of various kinds of museums and related institutions; emphasis on American museums; field trip. Same as 113:103, 97:115, 104:112, 7S:112.

24:113 Introduction to Conservation of Museum Objects **2 s.h.**
Theory and methods of museum conservation of ethnological, archaeological, and biological objects relative to handling, exhibition, and repository preservation; emphasis on composition of museum objects and how objects react with their environment.

24:114 Directed Studies and Projects **arr.**
Advanced readings in historical development, educational philosophy, programs, and operations of science museums; directed-study individual projects coordinated with programs, exhibits, or collections of the Museum of Natural History. May be repeated. Prerequisites: 24:110 and 24:112.

24:115 Directed Studies and Projects **arr.**
Continuation of 24:114, but may be taken as independent unit. May be repeated. Prerequisites: 24:110 and 24:112.

24:146 Description and Organization of Materials I **3 s.h.**
Same as 21:152.

24:180 Museum Internship **arr.**
Practical working experience designed to introduce the intern to functions, departments, and programs of the sponsoring museum and to relate the experience to the museum's overall mission and to the museum field in general. Consent of departmental faculty and sponsoring museum required.

MUSIC

Interim director: John D. Hill
Professors: Kenneth Amada, Walter T. Atcherson, Delores Bruch, Frederick Crane, Lowell Cross, Thomas L. Davis, Delbert Disselhorst, James Dixon, Kenneth Gaburo, Albert Gammon, Beaumont Glass, David Greenhoe, Sven Hansell, John D. Hill, D. Martin Jenni, Edward L. Kottick, Leopold La Fosse, Betty Bang Mather, Dorothy T. McDonald, Allen Ohmes, William Preucil, Marilyn Somville, Ronald Tyree, Myron D. Welch, Charles Wendt
Professors emeriti: Paul Anderson, Norma Cross, Robert Eckert, Richard B. Hervig, Albert T. Luper, Thomas Muir, Frank Piersol, Eldon Obrecht, Charles B. Righter, John Simms, Marvin Thostenson, Thomas Turner, Himie Voxman
Associate professors: Elizabeth Aubrey, Richard J. Bloesch, Jocelyn Carmichael, Michael Eckert, Kate Gfeller, Don R. Haines, William Hatcher, Morgan Jones, George Krem, Maurita Murphy Mead, Kristin Thelander, Carole Thomas, Robert Yeats
Assistant professors: Paula Boire, Don Coffman, Kenneth Phillips, Uriel Tsachor, Sylvia Wang, Mark Weiger, Eric Ziolek
Adjunct professor: Roger Mather
Instructor: Paul Scea
Undergraduate degrees offered: B.A. in Music; B.M.
Graduate degrees offered: M.A., M.F.A., Ph.D. in Music; D.M.A.

A primary element in a fine arts community of international repute, The University of Iowa School of Music has long been recognized as one of the excellent university-based schools of music in the United States.

The school's on-campus enrollment of approximately 500 students majoring in music is large enough to sustain strong programs in all areas of specialization, yet small enough to ensure the individual attention essential to each student's development.

The faculty consists of highly trained artist-teachers in each area of specialization. Faculty ensembles in residence include the Stradivari String Quartet, Iowa Woodwind Quintet, and the Iowa Brass Quintet. Private lessons with faculty members are offered in all band and orchestra instruments, voice, piano, and organ.

At the undergraduate level, the school's curricula offer all qualified students the opportunity for further study of music toward either professional or avocational goals. The graduate curricula are designed primarily as preparation for teaching in secondary schools, colleges, and universities and for careers in performance.

The school is a charter member of the National Association of Schools of Music.

Undergraduate Programs

The school offers the Bachelor of Arts and the Bachelor of Music. Candidates for the B.M. degree may count more than 50 semester hours of course work in music toward the 124 semester hours required for graduation; candidates for the B.A. may not. Areas of concentration offered in both programs are performance, composition, theory, music history, jazz studies, and music therapy. Programs leading to certification also are available in music education and music therapy.

General Requirements

All undergraduate enrollments require School of Music approval. Entering undergraduate students who plan to major in music are expected to audition either in person or by tape recording in advance of registration. Transfer students also must provide evidence of acceptable levels of performance ability and must consult with a representative from the theory area to determine their level of competence in that area.

Bachelor of Music

Course Work

All baccalaureate candidates in music must satisfy the College of Liberal Arts General Education Requirements, except that B.M candidates are exempt from the historical perspectives requirement. The following School of Music course requirements also must be met.

25:1-4 Musicianship and Theory I-IV 16 s.h.
25:71-72 Group Instruction in Piano I-II or the successful completion of proficiency exams I and II 2 s.h.
(It is advisable to complete this requirement by the end of the sophomore year.)
25:74 Recital Attendance (required of all undergraduate majors for seven semesters) 7 s.h.
25:107 Techniques of Conducting 2 s.h.
25:144 History of Music I 3 s.h.
25:146 History of Music II 3 s.h.

25:154 Senior Recital 1 s.h.
(To complete the senior recital, students must have achieved upper-level applied status or be enrolled in upper-level applied music courses. See "Applied Music" in this section of the *Catalog*.)

At least four semester hours of electives from these:

25:155 Composition 2 s.h.
25:117 Arranging for Band 2 s.h.

25:145 Counterpoint before 1600 3 s.h.
or
25:147 Counterpoint after 1600 3 s.h.

25:148 Analysis of Music Literature 1600-1750 3 s.h.
25:149 Analysis of Music Literature 1750-1825 3 s.h.
25:150 Analysis of Music Literature 1825-1900 3 s.h.
25:151 Analysis of Music Literature 1890-Present 3 s.h.
25:152 Analysis of Music Literature Special Topics 3 s.h.
25:153 Keyboard Harmony 2 s.h.
25:157 Orchestration 2 s.h.
25:212 Gregorian Chant 3 s.h.

25:101 Jazz Improvisation I 2 s.h.
or
25:102 Jazz Improvisation II 2 s.h.
or
25:243 Jazz Improvisation III 2 s.h.
or
25:244 Jazz Improvisation IV 2 s.h.

(The combination of courses 25:145 and 25:147 or courses 25:101 and 25:102 or courses 25:243 and 25:244 may not be used exclusively to fulfill this four-semester-hour requirement.)

Applied Music

Four years of applied music are required. Instruction is separated into two levels, lower and upper. Students must achieve upper-level status before they can give the senior recital. Determination of readiness for passing into upper-level applied music is determined in the student's areas of instruction. Students are allowed a maximum of 6 semester hours (not including summer) in the lower-level applied instruction. Those wishing to continue lessons beyond the maximum allowable lower-level registration must do so under the nonmajor category.

Ensemble Requirements

Students also must participate in a major ensemble each semester of residence. During the summer session, students must be available for ensemble participation as needed. Ensemble assignments are made at the discretion of the major teacher and ensemble director. String majors participate in University Orchestra and/or Chamber Orchestra. Keyboard majors may substitute accompanying for major ensemble participation for two semesters during their junior and/or senior years, with the consent of their advisers.

Any requests for adjustment of this requirement should be submitted in writing to a review committee consisting of the ensemble directors involved, the adviser, the major teacher, and a representative from the director's office. The committee meets regularly at the end of each early registration period.

Major ensembles are:

25:142 Camerata Singers 1 s.h.
25:194 Symphony Band/Concert Band/University Band 0-1 s.h.
25:191 University Chorale arr.
25:185 Kantorei/University Choir arr.
25:192 Orchestra 0-1 s.h.

Students may take advanced electives in performance (including chamber music and piano accompanying), theory, composition, music education, music history, music literature, orchestration, and conducting.

Performance Major

Performance majors are available in each of the orchestral areas—strings, brass, woodwinds, and percussion—and in voice and keyboard. Students must take at least 17 additional semester hours beyond the School of Music general course requirements, to be chosen from a list of electives unique to each performance major area. Course listings for each of the respective areas are available from the music office.

Jazz Studies Emphasis

Students are admitted to this program only by audition, which occurs after they complete the freshman year. When admitted, they are assigned a jazz studies adviser in addition to their regular faculty adviser.

Senior recital and recital attendance requirements are the same as those for the B.M. degree. Course requirements are the same as those for the B.M. degree plus an additional 28 semester hours of jazz courses for performance majors, or an additional 18 semester hours for those in the music education certification program. Students in the jazz studies emphasis program must attend a weekly jazz seminar.

Music Therapy

Admission to the program in music therapy is based on successful completion (grade of C or better) of 25:114 Orientation to Music Therapy. In addition to the core courses in music therapy listed below, specific courses are required in biology, sociology, abnormal psychology, and social psychology.

A six-month internship in an approved off-campus clinical facility is required before the completion of the degree. Following successful completion of the internship, students may apply for registration with the National Association for Music Therapy and are qualified to sit for the board certification examination. To increase their job opportunities in the education sector, students are encouraged to complete music teacher certification requirements. Complete information on the program is available in the music education office.

Course requirements for the major in music therapy are as follows.

25:94 Music Therapy Practicum (three semesters, for 1, 2, and 2 semester hours, respectively)	5 s.h.
25:96 Music Techniques in Special Education and Recreation	3 s.h.
25:114 Orientation to Music Therapy	2 s.h.
7S:144 Psychology of Music	2 s.h.
7S:149 Behavioral Research in Music	2 s.h.
25:138 Music Therapy Techniques: Atypical Children	3 s.h.
25:139 Music Therapy Techniques: Adult Clients	3 s.h.
25:140 Internship in Music Therapy	2 s.h.

Composition Major

Applicants should submit examples of creative work for evaluation by the composition faculty. Upon admission to the program, students are assigned a faculty adviser.

Students fulfill the general requirements of the Bachelor of Music degree as stated in the *Catalog*. Beyond these requirements, additional hours of electives are required, including studies in composition, experimental music studio, music theory, music history, and applied music. An appropriate plan of study is designed by the students in consultation with the adviser.

The Bachelor's Thesis (25:99) replaces the recital required of applied music majors. It consists of one or more compositions, approved by a committee of three faculty members, and performed on regularly scheduled School of Music recitals.

Theory Major

Applicants should submit papers (and/or other evidence of scholarly pursuit) for evaluation by the theory faculty. Upon admission to the program, students are assigned a faculty adviser.

Students fulfill the general requirements for the Bachelor of Music degree as stated in the *Catalog*. Beyond these requirements, additional hours of electives are required, including studies in music theory, music history, composition, and applied music. An appropriate plan of study is designed by the student in consultation with the adviser.

The Bachelor's Thesis (25:99) replaces the recital required of applied music majors. It consists of a paper that deals in scholarly fashion with theoretical matters, approved by the theory faculty.

Bachelor of Arts

The B.A., with its 50 semester hours of allowable music credit, is offered for all performance majors listed under the B.M. degree as well as history and composition. The B.A. is not available in the music therapy, theory, or jazz emphasis programs. Students may earn teacher certification if they complete the curriculum listed for the appropriate certification program (e.g., strings; brass, woodwind, and percussion; vocal and keyboard; see "Teacher Certification (Music Specialist)," below). Specific course requirements vary for each of the available majors under the B.A. degree, although all College of Liberal Arts General Education Requirements must be met for each. Students should check with their advisers, the area head, or the music office for specific program requirements.

Teacher Certification (Music Specialist)

Areas of concentration in music education are instrumental music, vocal music, and music in special education. In addition to the B.A. or B.M. requirements in music and liberal arts, certification to teach music in Iowa schools requires satisfactory completion of specific requirements in the area of concentration. Requirements in the instrumental and vocal areas are listed below. The general requirements are listed under "Secondary Education" in the "College of Education" section of the *Catalog*.

String Majors

Instruction in performance (violin and viola majors take one year of 25:23 Cello; cello and bass majors take one year of 25:21 Violin)	2 s.h.
25:100 Class Strings (violinists take viola and bass; violists take violin and bass; cellists take viola and bass; bassists take viola and cello)	2 s.h.
7S:143 Instrumental Techniques (normally clarinet and cornet)	8 s.h.
25:108 Instrumental Conducting	2 s.h.
7S:150 String Methods and Materials	4 s.h.
7S:96 Introduction to Teaching Music	2 s.h.
7E:144 Methods and Materials: Elementary School Instrumental Music	2 s.h.
7S:191 Observation and Laboratory Practice in the Secondary School	6 s.h.
7E:192 Special Area Student Teaching	6 s.h.
7S:187 Seminar: Curriculum and Student Teaching	1 s.h.

String majors preparing for music teacher certification must pass the proficiency examinations of 25:71-72 Group Instruction in Piano I-II.

Brass, Woodwind, and Percussion Majors

Brass, woodwind, and percussion majors in music education participate in a concert band each semester and in marching band for two fall semesters during the first two years in residence at the University. Exceptions to this policy must be approved by the music education adviser.

Courses required include the following.

7S:143 Instrumental Techniques	8 s.h.
25:182 Marching Band Techniques	1 s.h.
25:196 Jazz Band Techniques	1 s.h.
7E:144 Methods and Materials: Elementary School Instrumental Music	2 s.h.
7S:96 Introduction to Teaching Music	2 s.h.
7S:138 Practicum Band Instrument Care and Repair	1 s.h.
7S:140 Band Methods and Materials	3 s.h.
7S:145/25:108 Instrumental Conducting	2 s.h.
7S:191 Observation and Laboratory Practice in the Secondary School	6 s.h.
7E:192 Special Area Student Teaching	6 s.h.
7S:187 Seminar: Curriculum and Student Teaching	1 s.h.

Students preparing for music teacher certification must pass the proficiency examinations of 25:71-72 Group Instruction in Piano I-II.

Vocal and Keyboard Majors

Vocal performance majors should consult the music office for recommendations.

7S:139 Child and Adolescent Voice Production	2 s.h.
7S:147 Choral Methods	3 s.h.
7S:148 Choral Conducting and Literature	3 s.h.
25:115-116 Diction for Singers I-II	4 s.h.
7S:96 Introduction to Teaching Music	2 s.h.
7E:145 Methods and Materials: Elementary School General Music	3 s.h.
7S:142 Methods and Materials: Secondary School General Music	3 s.h.
7S:191 Observation and Laboratory Practice in the Secondary School	6 s.h.
7E:192 Special Area Student Teaching	6 s.h.
7S:187 Seminar: Curriculum and Student Teaching	1 s.h.

Vocal and keyboard majors preparing for music teacher certification must pass the proficiency examination of 25:71-72 Group Instruction in Piano I-II. In addition, keyboard majors should register for 25:17 Non-Major Voice for two semesters. Vocal majors should register for 25:18 Non-Major Piano for two semesters.

Keyboard Majors (Nonvocal)

Keyboard majors who elect to teach in the nonvocal area must complete the requirements in either the brass-woodwind-percussion or string areas and pass the proficiency examination of 25:71-72 Group Instruction in Piano I-II.

Elementary Education Music Endorsement

Students majoring in elementary education may earn an area of specialization in music by completing the approved certification program for elementary teachers and 24 semester hours as follows.

All of these (8 semester hours):

25:1 Musicianship and Theory I	4 s.h.
25:2 Musicianship and Theory II	4 s.h.

Students with limited experiences in music may find it helpful to register for 25:10 Fundamentals of Music (3 s.h.), offered fall and spring semesters, before registering for 25:1-2.

Two of these (4 semester hours):

25:71-72 Group Instruction in Piano I-II (or successful completion of proficiency exams I and II)	2 s.h.
25:78 Beginning Folk Guitar	2 s.h.
25:17 Non-Major Voice (2 semesters)	0-1 s.h.
25:18 Non-Major Piano (2 semesters)	0-1 s.h.

One of these (1 semester hour):

25:95 Old Gold Singers	0-2 s.h.
25:185 Kantorei/University Choir	arr.
25:142 Camerata Singers	1 s.h.
25:191 University Chorale	arr.

All students must audition prior to registering for choral ensemble.

Two of these (6 semester hours):

25:103 World Music I	3 s.h.
25:104 World Music II	3 s.h.
25:106 History of Black Music	3 s.h.
25:13 Masterpieces of Music I	3 s.h.
25:14 Masterpieces of Music II	3 s.h.

Both of these (5 semester hours):

7E:145 Methods and Materials: Elementary School General Music	3 s.h.
7E:192 Special Area Student Teaching	2 s.h.
Total	24 s.h.

Students who want to complete the area of specialization in music without certification endorsement may substitute other courses for 7E:192 with the adviser's approval.

Honors

Freshman and sophomore music majors with an interest in scholarship and a grade-point average of at least 3.20 are invited to become members of the College of Liberal Arts Honors Program (see the "College of Liberal Arts" section of the *Catalog*). They also may take part in the honors program of the School of Music. Some entering freshmen will already have been invited to join on the basis of their high school record and ACT scores.

Throughout undergraduate residence, honors music students may take advantage of enrollment in honors sections of courses in the school and in the college, and may seek honors designation for any course with the consent of the course instructor.

Students with junior or senior standing who are in the honors program may undertake work leading to the bachelor's degree (B.M. or B.A.) with honors. Graduation with honors is awarded after completion of 6-8 semester hours in 25:97 Honors in Music. Honors projects for which credit is given in 25:97 include honors performances (solo and/or ensemble); honors compositions (or transcriptions, orchestrations, arrangements); and honors essays, research papers, editing, translations. A combination of at least two of these types of projects is required. None of the projects may duplicate projects assigned in other courses, nor may they be required for graduation (e.g., 24:154 Senior Recital).

Honors students in music are encouraged to take graduate-level courses. Advanced course work in music history, music theory, and languages is particularly recommended. An honors committee appointed by the honors adviser and the student's faculty sponsor evaluates the student's work.

See the music honors adviser for more information.

Financial Aid

A number of music activity scholarships are available to qualified undergraduate music majors. For information, write to the School of Music.

Minor

Students may minor in music by completing 15 semester hours in the School of Music, 12 of which must be in advanced courses. A complete list of advanced courses is available at the music office.

Graduate Programs

Entering graduate students must take the School of Music advisory examination in music theory (harmony, ear training, forms, and counterpoint) and history and literature before registering. The advisory examination is given each session on the two days (excluding Sunday) before registration. Students with deficiencies in theory must register for 25:11 Review Theory. A leaflet describing the general content of these tests is available from the director's office, School of Music. General graduate admission, degree, and examination requirements are stated in the "Graduate College" section of the *Catalog*.

Theory Pedagogy Minor

Candidates for graduate degrees in music may elect a minor in music theory pedagogy by completing the following courses.

25:145 Counterpoint before 1600	3 s.h.
or	
25:147 Counterpoint after 1600	3 s.h.
25:234 Observation and Practice Teaching in Theory	1-2 s.h.
25:236 Methods and Techniques of Teaching Basic Theory	3 s.h.

Three of these:

25:148 Analysis of Music Literature 1600-1750	3 s.h.
25:149 Analysis of Music Literature 1750-1825	3 s.h.
25:150 Analysis of Music Literature 1825-1900	3 s.h.
25:151 Analysis of Music Literature 1890-Present	3 s.h.
25:152 Analysis of Music Literature Special Topics	3 s.h.
25:212 Gregorian Chant	3 s.h.

Master of Arts

The Master of Arts is offered in performance (including conducting), composition, music theory, musicology, and music education. Performance majors present a public recital in lieu of a written thesis. The Master of Arts without thesis is offered in music education. Both thesis/recital and nonthesis degrees require a minimum of 30-33 postbaccalaureate semester hours. Information about specific admission and curricular requirements for each degree is available from the School of Music. All curricula must include the requirements listed below.

General Requirement

25:321 Introduction to Graduate Study in Music	2 s.h.

Music Theory

25:240 Introduction to Contemporary Analysis and Theory 3 s.h.
One elective from 25:145, 25:147, 25:148, 25:149, 25:150, 25:151, 25:152, 25:212
25:11 Review Theory as determined by advisory exam

Music History

25:301-302 Advanced History and Literature of Music I-II or satisfactory advisory examination score

If excused from 25:301 and/or 25:302 as a result of the advisory examination, students elect another course from the music history sequence 25:303-309, 25:313-314, 25:316-317, 25:323-324, 25:330-332, and may elect other musicology courses.

Ensemble Participation

Students participate in a major ensemble each semester of residence (see list of major ensembles in this section of the *Catalog*). During the summer session, students must be available for ensemble participation as needed. Ensemble assignments are made by the major teacher and the ensemble director. Keyboard majors may substitute accompaniment for participation in a major ensemble, at their adviser's discretion. Theory, composition, musicology, and music education majors may, with their adviser's permission, substitute other ensembles.

Requests for adjustment of this requirement must be submitted in writing to a review committee consisting of the ensemble directors involved, the adviser, the major teacher, and a representative from the director's office. The committee meets regularly at the end of each early registration period.

Admission

Before applicants are considered for admission, they must submit supporting materials in their indicated area of concentration, as follows.
Composition—representative musical scores
Theory—analyses or research papers
Music education—letters of recommendation
Performance (including conducting)—audition
Musicology—research papers, theses
Pedagogy—contact School of Music

Information about specific admission and curricular requirements for each area is available from the director's office.

Master of Fine Arts

The M.F.A. is for students of superior ability in composition, instrumental or vocal performance, conducting, and opera theater directing. It requires a minimum of 60 postbaccalaureate semester hours.

In addition to the entrance and curricular requirements for the Master of Arts degree, students also must present at least two full-length recitals or programs (25:401 M.F.A. Thesis), for which a maximum of 8 semester hours of credit are granted. Students may earn a Master of Arts degree while working toward the Master of Fine Arts degree, but all requirements for each degree—including two final examinations—must be met separately, with a minimum combined total of 60 semester hours of graduate credit. (See the "Graduate College" section of the *Catalog* for further details.)

Doctoral Degrees

General Requirements

All doctoral study in music includes:

Minimum course requirements listed under the M.A. degree;

One or more additional electives from the following: 25:145, 25:147, 25:148-152, 25:212;

One or more additional courses in the history of music chosen from those listed in the master's degree requirements;

25:295 Musical Acoustics;

Reading proficiency in at least one foreign language (must be completed before comprehensive examination; music education students may substitute two courses in statistics for this requirement); and

Dissertation.

Doctoral students must participate in a major ensemble during each term of registration unless excused by their advisers (see list of major ensembles in this section of the *Catalog*). During the summer session, students should be available for ensemble participation as needed. Keyboard majors may substitute accompaniment in place of a major ensemble, at the adviser's discretion.

Doctor of Philosophy

Areas of concentration for the Ph.D. include composition, musicology, music education, music theory, and music literature.

The music literature program is designed for students who already have achieved a professional level of musical performance. They are required to audition in their major performance area.

Information about specific admission and curricular requirements for each area is available from the director's office.

Doctor of Musical Arts

Requirements for the D.M.A. degree in performance and pedagogy are the general doctoral requirements of the school, except that the D.M.A. dissertation consists of three full-length recitals or two recitals and a concerto performance with orchestra or other appropriate ensemble. Vocalists may substitute the execution of one or more major roles in a large-scale work for one of their recitals. Conductors present two programs.

D.M.A. candidates also must complete a scholarly investigation of limited scope in a written essay.

Admission

Before students are considered for admission to a doctoral program, they must have submitted supporting materials in their indicated area of concentration, as follows.
Composition—representative musical scores
Theory—analyses or research papers
Music education—research papers
Music literature—research papers and audition
Performance (including conducting)—audition
Music history and musicology—research papers, theses

Graduate Awards

Qualified graduate students are invited to apply for teaching and research assistantships. Inquiries should be directed to the School of Music.

Music for Nonmajors

Courses particularly recommended for students who are not majoring in music but who have an avocational interest in it include 25:13-14 Masterpieces of Music; 25:159 Late Eighteenth- and Nineteenth-Century Composers; 25:160 Early Eighteenth- and Twentieth-Century Composers; the sequence 25:103-104 World Music I-II, for students interested in non-Western music; and 25:10 Fundamentals of Music. 25:78 Beginning Folk Guitar is available for nonmajors who wish to develop elementary performance skills for personal musical growth and enjoyment.

Participation in School of Music ensembles is open to all University students with the ensemble director's approval (see list of major ensembles in this section of the *Catalog*).

Nonmajors interested in performance should consult music advisers regarding appropriate courses in applied music.

Special Programs

The Center for New Music is a performance ensemble within the School of Music. Begun in 1966 with a grant from The Rockefeller Foundation, the center provides stipends for skilled resident musicians who form a nucleus ensemble for the express purpose of performing twentieth-century music. As a vital ingredient of the School of Music's composition program, the Center for New Music functions as a research and performance laboratory for staff and students, and as a repertoire ensemble for

the continued performance of new music. Audition information is available on request.

Facilities

The Iowa Center for the Arts has one of the nation's finest facilities for teaching and performance in music. In addition to class and seminar rooms, the Music Building includes 55 teaching studios, 73 practice rooms, a library, two electronic music laboratories, ear training and listening facilities with 50 listening posts, four large rehearsal halls, ample solo and ensemble practice facilities, professional recording facilities, a fine arts computer studio with six terminals and five microcomputers, seven practice and recital organs, the 80-seat Krapf Organ Studio, and the 720-seat Clapp Recital Hall. Hancher Auditorium seats 2,680 people for concerts and 2,400 for operas and other stage productions.

Resources of the Rita Benton Music Library include more than 68,000 volumes of music and books, some 3,000 titles in microformats, over 14,000 sound recordings (including compact discs and videotapes), and 300 current periodicals in several languages. The collection of reference materials is particularly strong, supporting research in many areas of musical study. The rare book holdings include a large number of late eighteenth- and nineteenth-century scores. The library's quarters in the Music Building provide seating for 100 people in the reading room and 35 at the listening stations in the sound recordings room. Physical facilities also include a combined rare book and seminar room and spaces for microform readers, typewriters, and videotape machines.

Courses

General

25:000 Cooperative Education Internship 0 s.h.

25:13 Masterpieces of Music I 3-4 s.h.
Major composers from the late eighteenth through nineteenth centuries. GER: humanities.

25:14 Masterpieces of Music II 3-4 s.h.
Major compositions from the early eighteenth century and 1890s to the present. GER: humanities.

Theory and Composition

25:1 Musicianship and Theory I 4 s.h.
Aural skills, analysis, foundations of musical phenomena from wide-ranging historical and cultural repertories; fundamentals of tone, form, principles of organization, ground rules of composition, and notions of esthetics studied through listening, writing, and discussion.

25:2 Musicianship and Theory II 4 s.h.
Continuation of 25:1.

25:3 Musicianship and Theory III 4 s.h.
Continuation of 25:1-2, with focus on common-practice musical repertory.

25:4 Musicianship and Theory IV 4 s.h.
Continuation of 25:1-3, with focus on twentieth-century musical repertories.

25:9 Introduction to Music 3 s.h.

25:10 Fundamentals of Music 3 s.h.
Musical notation; elementary melodic, rhythmic, and harmonic theory; basic aural skills; for students with little or no previous experience. Not open to music majors.

25:11 Review Theory 1 s.h.
Offered fall semesters and summer sessions.

25:59 American Ballad 3 s.h.

25:64 Recital Attendance for Non-Majors 1 s.h.
Exposure to musical experiences through attendance at School of Music student and faculty recitals.

25:74 Recital Attendance 1 s.h.
For majors.

25:99 Bachelor's Thesis 0-1 s.h.
Required of composition, theory, and music history majors. Consent of instructor required.

25:145 Counterpoint before 1600 3 s.h.
Writing and analysis. Prerequisite: 25:3 or equivalent.

25:147 Counterpoint after 1600 3 s.h.
Writing and analysis. Prerequisite: 25:3 or equivalent.

25:148 Analysis of Music Literature 1600-1750 3 s.h.
May be repeated. Prerequisite: 25:3 or equivalent.

25:149 Analysis of Music Literature 1750-1825 3 s.h.
May be repeated. Prerequisite: 25:3 or equivalent.

25:150 Analysis of Music Literature 1825-1900 3 s.h.
May be repeated. Prerequisite: 25:3 or equivalent.

25:151 Analysis of Music Literature 1890-Present 3 s.h.
May be repeated. Prerequisite: 25:4 or equivalent.

25:152 Analysis of Music Literature Special Topics 3 s.h.
Scope and content chosen by instructor.

25:153 Keyboard Harmony 1-2 s.h.
May be repeated. Prerequisites: 25:3 and keyboard proficiency.

25:155 Composition 2 s.h.
Prerequisite: 25:1 or consent of instructor.

25:156 Composition Seminar 0-1 s.h.
Consent of instructor required. Prerequisite: advanced standing.

25:157 Orchestration 2 s.h.
Prerequisite: 25:4.

25:212 Gregorian Chant 3 s.h.
Performance practice and analysis of Gregorian chant; organization of Roman liturgy. Recommended: some knowledge of Latin.

25:215 Experimental Music Seminar 0 s.h.
Presentation and in-depth critique of experimental work.

25:223 Advanced Composition arr.
May be repeated. Consent of instructor required. Corequisite: 25:156.

25:234 Observation and Practice Teaching in Theory 1-2 s.h.

25:235 Auditioning Workshop 1-2 s.h.
Offered summer sessions.

25:236 Methods and Techniques of Teaching Basic Theory 3 s.h.
Kinds of music theories—speculative, analytical, empirical; available textbooks; pedagogical skills and techniques, including computer-aided instruction.

25:237 Seminar: Music Theory Research arr.

25:240 Introduction to Contemporary Analysis and Theory 3 s.h.
Systematic introduction to methods of analysis and score study; categories of music theories; applications of set theory and information theory to music; survey of analytical systems and procedures (Schenker, Lendvai, Tovey, Forte, Réti). Designed to equip graduate students to deal with all genres and styles of Western music.

25:241 History of Music Theory I 2 s.h.

25:242 History of Music Theory II 2 s.h.

25:250 Experimental Studio I 3 s.h.
Experimental composition in association with technology, perception, and related cognitive processes. Consent of instructor required. Corequisite: 25:215.

25:251 Experimental Studio II 3 s.h.
Advanced experimental composition in association with technology, perception, and related cognitive processes. Consent of instructor required. Prerequisite: 25:250. Corequisite: 25:215.

25:253 Multimedia III 3 s.h.
Experimental performance; projects developed in association with technology, perception, and related cognitive processes. Consent of instructor required. Corequisite: 25:215.

Historical Surveys and Musicology

25:103 World Music I 3 s.h.
Introduction to the music of the indigenous peoples of sub-Saharan Africa, the Americas, Australia, and Oceania. GER: foreign civilization and culture, humanities. Offered spring semesters of even years.

25:104 World Music II 3 s.h.
Musical styles of India, China, Korea, Japan, Indonesia, Iran, and the Arab countries. GER: humanities. Offered spring semesters of odd years.

25:106 History of Black Music 3 s.h.
Same as 129:130.

25:144 History of Music I 3 s.h.
GER: historical perspectives. Consent of instructor required for nonmajors. Prerequisites: for music majors, 25:3 and 25:4, or equivalents.

25:146 History of Music II 3 s.h.
GER: historical perspectives. Prerequisites: for music majors, 25:3 and 25:4, or equivalents.

25:159 Late Eighteenth- and Nineteenth-Century Composers 3-4 s.h.

25:160 Early Eighteenth- and Twentieth-Century Composers 3-4 s.h.

25:198 Organ Pedagogy 1-2 s.h.
History, theory, and practice of organ teaching from the Renaissance to the present; survey of methods and literature appropriate for various levels of teaching. May be repeated.

25:216 Interpretation of German Art Song arr.

25:217 Interpretation of Non-German Art Song arr.

25:238 Musicology Colloquium 0 s.h.

25:301 Advanced History and Literature of Music I 3 s.h.
Style in Western music.

25:302 Advanced History and Literature of Music II 3 s.h.
Continuation of 25:301, but may be taken as independent unit with consent of instructor.

Note: 25:303-25:309 and 25:313-25:314 deal with periods and special topics in the history of music; each of these courses is offered about once every two years.

25:303 Medieval Music 3 s.h.

25:304 Renaissance Music 3 s.h.

25:305 Seventeenth-Century Music 3 s.h.

25:306 Eighteenth-Century Music 3 s.h.

25:307 Nineteenth-Century Music 3 s.h.

25:308 Twentieth-Century Music 3 s.h.

25:309 American Music 3 s.h.

25:313 Major Composers 3 s.h.

25:314 Genres of Music 3 s.h.

25:316 The History of Musical Instruments 3 s.h.
Classification and worldwide varieties of musical instruments, and history of instruments in the West.

25:317 Principles of Construction and Maintenance of Historical Keyboard Instruments 3 s.h.
Acoustics, tuning, maintenance, and repair of historical instruments.

25:320 Introduction to Musicology 3 s.h.
Methods and materials of research in historical musicology; survey of the field of musicology.

25:321 Introduction to Graduate Study in Music 2 s.h.
Use of the music library; reference materials; bibliography; research problems and methods; writing research papers.

25:322 Advanced Bibliography and Reference Materials 4 s.h.
Intensive bibliography, including additional materials in students' major field of concentration. Prerequisite: 25:321 or consent of instructor.

25:323 Historical Music Notations I 3 s.h.
Renaissance white notation, keyboard tablatures, musical paleography; transcription of early vocal and instrumental notations; editorial problems.

25:324 Historical Music Notations II 3 s.h.
Chant neumes, medieval black notation, musical and textual paleography; transcription of early vocal and instrumental notations; editorial problems.

25:330 Seminar in Musicology 3 s.h.
Concentrated study of one or more selected areas of music history, involving written papers and oral reports. May be repeated.

25:331 Performance Practices I: Medieval and Renaissance Music 3 s.h.
Practical approaches to interpreting music before 1600, including use of instruments, vocal production, musica ficta, and ornamentation.

25:332 Performance Practices II: Seventeenth- and Eighteenth-Century Music 3 s.h.
Interpretation aspects of music of Baroque and Classical periods.

25:351 Survey of Song Literature I 3 s.h.
Solo song before Schubert.

25:352 Survey of Song Literature II 3 s.h.
Austrian and German Lieder from Schubert to present.

25:353 Survey of Song Literature III 3 s.h.
Nineteenth- and twentieth-century French, Italian, Scandinavian, Spanish, and Slavic songs.

25:354 Survey of Song Literature IV 3 s.h.
Nineteenth- and twentieth-century British and North American songs.

25:361 Special Studies Piano Literature arr.
Individual research in special aspects of piano literature; primarily for D.M.A. students. May be repeated.

25:362 Special Studies in Piano Accompaniment and Chamber Music arr.
Performance required of pianists taking course for credit. Open to auditors and participants from other areas.

Sacred Music

25:227 Liturgics I 1-2 s.h.
History of liturgies and survey of liturgical music from Judaism to the present.

25:228 Service Playing and Improvisation 1-2 s.h.
Hymn playing, accompanying, and basic improvisation techniques. May be repeated. Offered fall semesters of even years. Open to organ majors and others by consent of instructor.

25:252 Hymnology 1-2 s.h.
Survey of historic hymnody: ancient odes, Latin hymns, Reformation hymns and psalms; current developments in hymnody and hymnals; may be presented as special topic study. May be repeated.

25:284 Studies in Church Music arr.
Individualized projects in selected areas of church music: liturgies, hymnody, church choir repertory; religion and the arts.

Jazz Studies

25:101 Jazz Improvisation I 2 s.h.
Prerequisite: 25:1 or consent of instructor.

25:102 Jazz Improvisation II 2 s.h.
Prerequisite: 25:101 or consent of instructor.

25:118 Jazz Composition and Arranging I 1-2 s.h.
Prerequisite: 25:4.

25:141 History of Jazz 2 s.h.
Prerequisite: 25:3 or equivalent.

25:196 Jazz Band Techniques and Pedagogy 1 s.h.

25:197 Jazz Band arr.
Consent of instructor required.

25:224 Small Jazz Ensembles 1 s.h.
Prerequisite: 25:102 or consent of instructor.

25:231 Jazz Composition and Arranging II 2 s.h.
Prerequisite: 25:118.

25:243 Jazz Improvisation III 2 s.h.
Prerequisite: 25:102 or consent of instructor.

25:244 Jazz Improvisation IV 2 s.h.
Prerequisite: 25:243 or consent of instructor.

Music and Technology

See also 25:250-251 Experimental Studio I and II and 25:253 Multimedia III under "Composition."

25:213 Fundamentals of Piano Technology 1 s.h.

25:214 Recording Techniques 3 s.h.
Consent of instructor required.

25:218 Art and Technology I 3 s.h.
Consent of instructor required.

25:219 Art and Technology II 3 s.h.
Consent of instructor required.

25:230 Seminar in Audio Recording 2 s.h.
Offered summer sessions.

25:295 Musical Acoustics 3 s.h.
Same as 29:112.

Research and Literature

25:143 Seminar: Percussion Methods, Materials, and Performance Practices 1-2 s.h.
Contemporary percussion literature and current styles, notation, techniques of performance and composition. Consent of instructor required.

25:154 Senior Recital 1 s.h.

25:199 Special Studies arr.

25:226 History of Organ Building and Design 2-3 s.h.
Development of organ design from the Middle Ages to the present; basic concepts of construction and maintenance. May be repeated.

25:229 Organ Literature 2 s.h.
Survey of organ literature from the fifteenth century to the present. May be repeated. Open to advanced undergraduate and graduate students.

25:261 Advanced Choral Literature I 3 s.h.
Choral music from Gregorian chant through Bach.

25:262 Advanced Choral Literature II 3 s.h.
Choral music from Rococo through contemporary.

25:291 Orchestral Literature arr.

25:293 String Instrument Literature arr.

25:294 Wind Instrument Literature arr.

25:296 Piano Literature I arr.

25:297 Piano Literature II arr.

25:335 Seminar in Woodwind Research 1 s.h.

25:339 Seminar: Operatic Literature arr.
Detailed study of important operatic scores from standpoint of performers and directors; production problems.

25:340 Seminar in Brass Research 1 s.h.

25:341 Seminar: Choral Literature and Analysis III 3 s.h.
Choral works from the Renaissance.

25:342 Seminar: Choral Literature and Analysis IV 3 s.h.
Choral works of the Baroque.

25:343 Seminar: Choral Literature and Analysis V 3 s.h.
Choral works of the Classic-Romantic period.

25:344 Seminar: Choral Literature and Analysis VI 3 s.h.
Contemporary choral works.

25:380 Readings in Music Theory arr.

25:381 Readings in Music History arr.

25:390 M.A. Performance Project arr.

25:400 M.A. Thesis arr.

25:401 M.F.A. Thesis arr.

25:402 M.A. Recital arr.

25:500 Ph.D. Thesis arr.

25:501 Composition Ph.D. Thesis arr.

25:502 D.M.A. Essay arr.

25:503 D.M.A. Recital arr.

Honors Program

25:97 Honors in Music 1-4 s.h.
May be repeated.

Music Education

Other music education courses are offered by the divisions of Early Childhood and Elementary Education and Secondary Education in the College of Education. See those sections of the *Catalog* for listings and descriptions. Where dual numbers are indicated, students preparing for music teacher certification should register under the education number.

25:71 Group Instruction in Piano I 1 s.h.
Beginning instruction for music majors whose principal performing medium is voice or an orchestral or band instrument; study includes development of skills in sight reading, technique, harmonization, transposition, improvisation, and simple literature.

25:72 Group Instruction in Piano II 1 s.h.
Elementary to early intermediate instruction for music majors whose principal performing medium is voice or an orchestral or band instrument; continuation of skills introduced in 25:71; introduction of easy solo and ensemble literature. Prerequisite: 25:71 or successful proficiency examination.

25:73 Group Instruction in Piano III 1 s.h.
Intermediate instruction for music majors whose principal performing medium is voice or an orchestral or band instrument; continuation of skills introduced in 25:72; study of intermediate solo and ensemble literature; modern chording. Prerequisite: 25:72 or successful completion of proficiency exam II.

25:78 Beginning Folk Guitar 2 s.h.
Development of guitar and basic skills. Consent of instructor required. Same as 7E:78.

25:79 Intermediate Folk Guitar 3 s.h.

25:82 Group Piano I: Non-Music 1 s.h.
Designed for the beginner; no previous background necessary; includes reading, technical study, chording, playing by ear, improvisation. Not open to music students.

25:84 Group Piano II: Non-Music 1 s.h.
Continuation of 25:82.

25:85 Advanced Folk Guitar 3 s.h.

25:93 Class Instruction in Vocal Technique and Performance 3 s.h.

25:94 Music Therapy Practicum 1-3 s.h.
Supervised clinical training with adult clients and children in a variety of health care settings. Students take three semesters of practicum for 1, 2, and 2 s.h. Open only to music therapy majors. Prerequisite: 25:114.

25:96 Music Techniques in Special Education and Recreation 2-3 s.h.
Music methods and materials appropriate for the handicapped in special education and recreational settings; overview of individualized educational planning for handicapped students. Open to music therapy and music education students; open to other students with consent of instructor.

25:100 Class Strings arr.
Open only to string majors for study of a secondary string instrument.

25:105 Instrumental Techniques 1-3 s.h.
Fundamental skills in wind and percussion instruments; for prospective teachers in public schools. Same as 7S:143.

25:107 Techniques of Conducting 2 s.h.

25:108 Instrumental Conducting 2 s.h.
Advanced skills for instrumental conducting, score analysis, rehearsal techniques, and literature selection. Same as 7S:145. Prerequisite: 25:107.

25:109 Choral Methods 3 s.h.
Same as 7S:147.

25:110 Choral Conducting and Literature 3 s.h.
Students preparing to teach in the elementary or secondary schools should register for 7S:148. Prerequisite: 25:107. Same as 7S:148.

25:111 Child and Adolescent Voice Production 2 s.h.
Principles and techniques of voice production and pedagogy for developing confident singers at the elementary and secondary school levels; specific skills-building program for implementation in vocal music programs. Same as 7S:139.

25:112 String Methods and Materials 2-4 s.h.
Same as 7S:150.

25:113 Methods of Teaching Piano 2-4 s.h.
Methods, materials, and teaching techniques for the preschool student; the elementary, intermediate, and advanced pre-college student; and the adult learner; two-semester course. May be repeated.

25:114 Orientation to Music Therapy 2 s.h.
Overview of theory and practice in music therapy; general information on typical clients and places of employment.

25:115 Diction for Singers I 2 s.h.
English and French.

25:116 Diction for Singers II 2 s.h.
German and Italian.

25:117 Arranging for Band 2 s.h.

25:138 Music Therapy Techniques: Atypical Children 3 s.h.
Techniques and procedures in using music with various types of atypical children in clinical and educational settings. For music therapy students; open to special education students with approval of instructor. Prerequisites: 25:96 and 25:114.

25:139 Music Therapy Techniques: Adult Clients 3 s.h.
Techniques and procedures in the use of music with adult clients who have disabilities. Prerequisites: 25:96 and 25:114.

25:140 Internship in Music Therapy 2 s.h.
A six-month period of clinical training in an approved music therapy program under the direction of a registered music therapist.

25:158 Advanced Conducting 2 s.h.
Prerequisite: elementary conducting skills.

25:182 Marching Band Techniques 1 s.h.
Administration and charting for marching band. Offered spring semesters.

25:200 Seminar: Band Problems arr.
Advanced band literature; band history.

25:201 Principles of Voice Production 3 s.h.
Basic physical, physiological, and pedagogical principles involved in understanding professional, nonprofessional, and impaired voice production; vocal anatomy, voice classification, control of loudness, pitch, register, and quality; efficient and inefficient use of voice; instrumentation for voice analysis and synthesis. Same as 3:201.

25:202 Methods of Teaching Voice 3 s.h.
Comparison of a variety of pedagogical techniques of voice training; assessment of attitude, musicianship, foreign language aptitude, physical and emotional characteristics; mental images used to modify respiratory, phonatory, and articulatory behavior; vocal hygiene; performance anxiety; student-teacher relationships; administration in vocal schools and professional organizations. Same as 3:202.

25:203 Advanced Choral Conducting I 3 s.h.
Literature, style, related techniques, and methods in rehearsing music from Gregorian chant through Bach. Corequisite: 25:261.

25:204 Advanced Choral Conducting II 3 s.h.
Style and technique for conducting choral music from Rococo through contemporary. Corequisite: 25:262.

25:205 Advanced Choral Conducting III 3 s.h.
Choral works from the Renaissance. Corequisite: 25:341.

25:206 Advanced Choral Conducting IV 3 s.h.
Choral works from the Baroque. Corequisite: 25:342.

25:207 Advanced Choral Conducting V 3 s.h.
Choral works of the Classic-Romantic period. Corequisite: 25:343.

25:208 Advanced Choral Conducting VI 3 s.h.
Contemporary choral works. Corequisite: 25:344.

25:209 Advanced Instrumental Methods and Literature I 1-2 s.h.
Review of techniques, solo, ensemble, and study material for wind and percussion instruments.

25:210 Advanced Instrumental Methods and Literature II 1-2 s.h.

25:211 Advanced String Methods and Literature 3 s.h.
Advanced pedagogy for orchestral stringed instruments. Open to undergraduates with consent of instructor.

25:220 Instrumental Music Workshop 1 s.h.
Offered summer sessions. Same as 7S:241.

25:221 Special Studies in Music Therapy arr.
Individual research on special problems in music therapy. May be repeated. Consent of instructor required.

25:225 Score Reading 1 s.h.

25:232 Piano Pedagogy I 2 s.h.
Historical survey of theories of piano technique; central nervous system and piano playing; problems of piano playing and teaching; application of learning theories to the teaching of piano and development of piano performance; assorted pedagogical topics; group piano instruction at the college level, including techniques, materials, and supervised teaching experience.

25:233 Piano Pedagogy II 2 s.h.
Continuation of 25:232; development of piano performance and the philosophy and psychology of piano teaching; perceptual-motor learning theory; exploration of the connection between neurology and music.

25:283 Brass Pedagogy arr.
Survey of teaching techniques applicable to brass instruction. Open to undergraduates with consent of instructor.

Continuing Education Program

25:16 Let's Sing 3 s.h.

25:75 MIDI Home Studio Techniques 3 s.h.

25:76 Introduction to Opera 3 s.h.

25:77 Roots of American Music 3 s.h.

25:80 The Composer-Improviser in You 3 s.h.

25:83 Improvisational Forms 3 s.h.

25:88 Getting Started as a Free Lance Artist 3 s.h.

25:89 Jazz Appreciation 2-3 s.h.

25:90 Popular American Music 3 s.h.

25:98 Music Appreciation 3 s.h.

Applied Music Courses

Major Field

Students are charged a fee of $80 per semester for registration in all applied music courses in their major field of performance. Courses consist of individual and/or class lessons, at the instructor's option. Lessons are a minimum of one hour per week. Students may register for 1-4 semester hours as recommended by their adviser.

Students electing two applied music courses in the same semester are assessed a fee of $150. All music majors are expected to attend seminars of the applied music courses for which they register.

Undergraduate Major

Lower Level

25:40 Lower Level Voice arr.
25:41 Lower Level Piano arr.
25:42 Lower Level Organ arr.
25:43 Lower Level Harp arr.
25:44 Lower Level Violin arr.
25:45 Lower Level Viola arr.
25:46 Lower Level Cello arr.
25:47 Lower Level String Bass arr.
25:48 Lower Level Flute arr.
25:49 Lower Level Oboe arr.
25:50 Lower Level Clarinet arr.
25:51 Lower Level Bassoon arr.
25:52 Lower Level Saxophone arr.
25:53 Lower Level Horn arr.
25:54 Lower Level Trumpet arr.
25:55 Lower Level Euphonium arr.
25:56 Lower Level Trombone arr.
25:57 Lower Level Tuba arr.
25:58 Lower Level Percussion arr.

Upper Level

25:119 Upper Level Voice arr.
25:120 Upper Level Piano arr.
25:121 Upper Level Organ arr.
25:122 Upper Level Violin arr.
25:123 Upper Level Viola arr.
25:124 Upper Level Cello arr.
25:125 Upper Level String Bass arr.
25:126 Upper Level Flute arr.
25:127 Upper Level Oboe arr.
25:128 Upper Level Clarinet arr.
25:129 Upper Level Bassoon arr.
25:130 Upper Level Saxophone arr.
25:131 Upper Level Horn arr.
25:132 Upper Level Trumpet arr.
25:133 Upper Level Euphonium arr.
25:134 Upper Level Trombone arr.
25:135 Upper Level Tuba arr.

25:136 Upper Level Percussion arr.

25:137 Upper Level Harp arr.

Graduate Major

25:263 Major Voice arr.

25:264 Major Piano arr.

25:265 Major Harpsichord arr.

25:266 Major Organ arr.

25:267 Major Violin arr.

25:268 Major Viola arr.

25:269 Major Cello arr.

25:270 Major String Bass arr.

25:271 Major Flute arr.

25:272 Major Oboe arr.

25:273 Major Clarinet arr.

25:274 Major Bassoon arr.

25:275 Major Saxophone arr.

25:276 Major Horn arr.

25:277 Major Trumpet arr.

25:278 Major Euphonium arr.

25:279 Major Trombone arr.

25:280 Major Tuba arr.

25:281 Major Percussion arr.

Minor Field

Instruction in the student's minor field of performance or for nonmajors is offered for a fee of $55 per course per semester. A course consists of one half-hour lesson or two hours of class instruction weekly, at option of instructor. All nonmajor lessons are offered satisfactory/fail only. No letter grades may be given.

Undergraduate Nonmajor

25:17 Non-Major Voice 0-1 s.h.

25:18 Non-Major Piano 0-1 s.h.
Prerequisite: two years of previous instruction or music major.

25:19 Non-Major Organ 0-1 s.h.

25:20 Non-Major Harp 0-1 s.h.

25:21 Non-Major Violin 0-1 s.h.

25:22 Non-Major Viola 0-1 s.h.

25:23 Non-Major Cello 0-1 s.h.

25:24 Non-Major String Bass 0-1 s.h.

25:25 Non-Major Flute 0-1 s.h.

25:26 Non-Major Oboe 0-1 s.h.

25:27 Non-Major Clarinet 0-1 s.h.

25:28 Non-Major Bassoon 0-1 s.h.

25:29 Non-Major Saxophone 0-1 s.h.

25:30 Non-Major Horn 0-1 s.h.

25:31 Non-Major Trumpet 0-1 s.h.

25:32 Non-Major Euphonium 0-1 s.h.

25:33 Non-Major Trombone 0-1 s.h.

25:34 Non-Major Tuba 0-1 s.h.

25:35 Non-Major Percussion 0-1 s.h.

Graduate Nonmajor

25:161 Non-Major Voice 1 s.h.

25:162 Non-Major Piano 1 s.h.
Prerequisite: two years of previous instruction or music major.

25:163 Non-Major Organ 1 s.h.

25:164 Non-Major Harpsichord 1 s.h.

25:166 Non-Major Violin 1 s.h.

25:167 Non-Major Viola 1 s.h.

25:168 Non-Major Cello 1 s.h.

25:169 Non-Major String Bass 1 s.h.

25:170 Non-Major Flute 1 s.h.

25:171 Non-Major Oboe 1 s.h.

25:172 Non-Major Clarinet 1 s.h.

25:173 Non-Major Bassoon 1 s.h.

25:174 Non-Major Saxophone 1 s.h.

25:175 Non-Major Horn 1 s.h.

25:176 Non-Major Trumpet 1 s.h.

25:177 Non-Major Euphonium 1 s.h.

25:178 Non-Major Trombone 1 s.h.

25:179 Non-Major Tuba 1 s.h.

25:180 Non-Major Percussion 1 s.h.

Ensembles

No fee is charged for ensemble courses. Courses may be repeated. Consent of instructor required.

See also 25:253 Multi-Media III under "Theory and Composition" in this course listing.

25:95 Old Gold Singers 0-2 s.h.

25:142 Camerata Singers 1 s.h.

25:181 University Choir arr.

25:183 Chamber Orchestra 0-1 s.h.

25:184 Collegium Musicum arr.

25:185 Kantorei/University Choir arr.

25:186 Piano Accompaniment arr.

25:187 Piano Chamber Music arr.

25:188 String Chamber Music arr.

25:190 Wind Chamber Music arr.
Preparation and performance of representative literature by woodwind and brass chamber groups. Sections for woodwinds, brass, flute, and clarinet.

25:191 University Chorale arr.

25:192 Orchestra 0-1 s.h.

25:193 Marching Band 0-1 s.h.

25:194 Symphony Band/Concert Band/University Band 0-1 s.h.

25:195 Percussion Ensemble arr.

Opera

25:165 Opera Dance Theatre Production 1-2 s.h.
Experience in technical theater (costume or scene shops).

25:245 Opera Theater: Roles 2 s.h.
Opera performance in both workshop and full production situations; includes coaching for all participants.

25:246 Opera Theater: Chorus 1 s.h.
Study of opera chorus roles from vocal and dramatic standpoint.

25:248 Opera Theater: Directing Seminar arr.
Experience in directing scenes and/or one-act operas.

25:249 Opera Coaching and Accompanying arr.

25:289 Solo Roles arr.
Individual coaching for graduate students who are unable to participate in the opera workshop or in opera productions.

NEUROSCIENCE

Graduate degree offered: Ph.D. in Neuroscience

The Neuroscience Ph.D. Program is an interdepartmental program involving members of the Departments of Anatomy, Biology, Pharmacology, Physiology and Biophysics, and Psychology as well as a number of faculty members from clinical departments. See "Neuroscience" in the College of Medicine section of the *Catalog* for a list of participating faculty members, degree requirements, and courses.

PHILOSOPHIES AND ETHICS OF POLITICS, LAW, AND ECONOMICS

Director: Phillip Cummins

PEOPLE Program

The College of Liberal Arts offers an interdisciplinary program that leads to a certificate in Philosophies and Ethics of Politics, Law, and Economics—or PEOPLE. Departments primarily involved in the program include economics, philosophy, and political science. Students pursuing majors or minors in these departments are eligible to join the PEOPLE program; pre-law students may find it especially attractive.

Philosophies and Ethics of Politics, Law, and Economics is based on the assumption that societies institutionalize values: They generate institutions that guide conduct by governing opportunities, prescribing behavior, and influencing beliefs and attitudes. As people examine their behavior in society, they find that their roles as subjects, decision makers, and inquirers must be studied as both isolated and integrated in order to be understood.

The PEOPLE program enables its students to select courses that investigate causes, reasons, and values in behavior and how they intersect.

Because of the program's multiple requirements, students should begin as freshmen or sophomores. However, juniors who already have taken enough courses that satisfy PEOPLE requirements can enter and complete the program by the time they graduate. Students who complete the program requirements earn a certificate, and the notation "Certificate in the Philosophies and Ethics of Politics, Law, and Economics" appears on their transcript.

Students interested in enrolling in the PEOPLE program should contact the Office of Academic Programs, College of Liberal Arts.

Program Requirements

Students must complete 36 semester hours to earn the PEOPLE certificate. Those who have a major in one of the program's core departments and a minor in another may participate as long as they can fulfill the certificate requirements.

A course that meets a General Education Requirement and/or a requirement in the major or minor may also be used to meet a PEOPLE requirement.

Students must complete the following course of study.

Foundation

Each PEOPLE student must complete a major or minor in economics, philosophy, or political science. Within the chosen discipline, the student must take courses that provide basic familiarity with issues and methods of the discipline and that emphasize causes, reasons, or values. Requirements for each discipline are as follows.

Economics

Students must choose either the microeconomics or the macroeconomics track.

Microeconomics

6E:1 Principles of Microeconomics
6E:103 Microeconomics

6E:161 History of Economic Thought
or
6E:166 The Political Economy of Socialism

One course on issues in microeconomics, chosen from:

6E:111 Labor Economics
6E:133 Environmental Economics
6E:171 Antitrust: Legal and Economic Analysis
6E:173 Advanced International Economics
6E:175 Economic Analysis of Labor Markets
6E:177 Industrial Organization

Macroeconomics

6E:2 Principles of Macroeconomics
6E:105 Macroeconomics

6E:161 History of Economic Thought
or
6E:166 The Political Economy of Socialism

One course on issues in macroeconomics, chosen from:

6E:117 Money and Banking
6E:119 Economics of the Government Sector
6E:123 Political Economy of the Military-Industrial Complex
6E:125 International Economics
6E:129 Economic Development: Underdeveloped Areas
6E:131 Agricultural and Food Policy
6E:135 Regional and Urban Economics
6E:141 Economics of American Industries
6E:173 Advanced International Economics
6E:174 Monetary Economics

Philosophy

26:34 Philosophy and Human Nature
26:102 Introduction to Ethics

One course in the history of philosophy, chosen from:

26:111 Ancient Philosophy
26:112 Medieval Philosophy
26:114 Seventeenth-Century Philosophy
26:116 Eighteenth-Century Philosophy
26:117 Nineteenth-Century Philosophy
26:118 Twentieth-Century Philosophy
26:125 American Philosophy
26:141 Existentialist Philosophy

One course on relevant issues, chosen from:

26:104 Introduction to Philosophy of Science
26:132 Political Philosophy
26:133 Philosophy of History
26:187 Epistemology
26:196 Philosophy of the Human Sciences

Political Science

30:30 Introduction to Political Thought and Political Action

One course on methods of political analysis, chosen from:

30:118 Law and Social Change
30:135 Introduction to Positive Political Theory
30:180 Honors Seminar on the Study of Politics

One course on the history of political theory, chosen from:

30:131 Foundations of Political Theory
30:132 Modern Political Theory
30:133 Postmodern Political Theory
30:134 American Political Theory

One course on issues in political theory, chosen from:

30:138 Current Political Theory
30:139 Political Issues
30:159 Governing in the Future
30:182 Honors Seminar on Political Theory

Fields

Students must complete three courses (9 semester hours) in each of two of the following fields—economics, ethics, politics, and law—as follows.

Economics

6E:1 Principles of Microeconomics
and
6E:103 Microeconomics

or

6E:2 Principles of Macroeconomics
and
6E:105 Macroeconomics

One course on the history of economic theory, chosen from:

6E:161 History of Economic Thought
6E:166 The Political Economy of Socialism
16E:164 Modern European Social Thought: Adam Smith to Marx

Ethics

26:102 Introduction to Ethics

One course in the history of ethics, chosen from:

26:132 Political Philosophy
26:180 Analytic Ethics
26:182 History of Ethics
26:184 Moore, Prichard, and Ross

One course on issues in ethics, chosen from:

26:132 Political Philosophy
26:180 Analytic Ethics
32:158 Religious Ethics: Moral Character and Religious Faith
32:159 Political Theology and Social Existence
32:160 Christian Ideas of Church
32:161 History of Religious Ethics
32:163 Introduction to Biomedical Ethics

Politics

30:30 Introduction to Political Thought and Political Action

One course on the history of political theory, chosen from:

16E:165 Marx
30:131 Foundations of Political Theory
30:132 Modern Political Theory
30:133 Postmodern Political Theory
30:134 American Political Theory

One course on issues in political theory, chosen from:

16E:163 Origins of Contemporary Thought
30:138 Current Political Theory
30:139 Political Issues

Law

Liberal Arts undergraduates typically are not permitted to register for courses in the College of Law (prefix 91). PEOPLE program students may register for law courses if they register under a cross-listed liberal arts number, obtain prior approval from the director of the PEOPLE program, and obtain consent of instructor. Students may count the credit toward a liberal arts degree but not toward any subsequent University of Iowa law degree. The requirements are as follows.

One course on principles of legal theory, chosen from:

91:288 or 144:201 Jurisprudence
91:300 or 144:202 Issues in Law and Philosophy
91:357 or 144:203 Social Science in the Law
91:317 or 144:205 Legal Reasoning

One course on the history of legal theory, chosen from:

16E:114 or 91:264 Foundations of Anglo-American Law
30:116 American Constitutional Law and Politics
91:293 or 16A:110 Law in American History I
91:294 or 16A:111 Law in American History II
91:661 or 144:206 Legal History Seminar
91:667 or 144:207 Modern Constitutional History

One course on issues in legal theory, chosen from:

30:118 Law and Social Change
30:117 The Politics of Civil Rights and Liberties
30:174 or 131:180 Women and the Law
91:193 or 144:208 Human Rights in the World Community: Problems of Law and Policy
91:307 or 144:209 Legal Control of Sexuality and Sexual Conduct
91:345 or 144:210 Hard Cases: Science Policy and Values
91:319 or 144:211 Native American Law
91:660 or 144:212 Law, Medicine, and Public Policy
91:659 or 8:259 Law and Lawyers in Literature

Integration

The following are required.

Theory of Inquiry

One course chosen from:

26:104 Introduction to Philosophy of Science
26:196 Philosophy of the Human Sciences
30:180 Honors Seminar on the Study of Politics

Senior Seminar

144:144 Seminar: Philosophies and Ethics of Politics, Law, and Economics

Courses

144:144 Seminar: Philosophies and Ethics of Politics, Law, and Economics **3 s.h.**
Interdisciplinary consideration of topics that cross the boundaries between philosophy, political science, law, and economics. Open only to seniors in the PEOPLE program.

144:201 Jurisprudence **2-3 s.h.**
Selected legal philosophies, with emphasis on legal postivism and natural law; topics may include the nature of jurisprudence, the relationship between law and morality, authority, normativity, the institutional nature of law, and political obligation. Same as 91:288.

144:202 Issues in Law and Philosophy **2 s.h.**
Topics such as subjectivity and objectivity in law and in morals, theories of language, legal language, moral responsibility, legal responsibility, reasoning and legal reasoning. Same as 91:300.

144:203 Social Science in the Law **3 s.h.**
The use of empirical research in a wide variety of legal areas; how the law can best obtain, evaluate, and use such information; student skill development in methodology and statistics; the use of such knowledge to improve advocacy. Same as 91:357.

144:205 Legal Reasoning **arr.**
Recent theories, philosophical underpinnings; recent philosophical work on theory construction, knowledge, language, objectivity, and morality. Same as 91:317.

144:206 Legal History Seminar **arr.**
Same as 91:661.

144:207 Modern Constitutional History **arr.**
Civil rights and civil liberties issues in American legal and cultural history from World War II to 1960; research paper required. Pre- or corequisite: 91:232 or consent of instructor. Same as 91:667.

144:209 Legal Control of Sexuality and Sexual Conduct **arr.**
Legal regulation of sexual behavior, consensual and nonconsensual conduct; sexual harassment, homosexuality, rape, prostitution, pornography, and tort liability for harmful sexual conduct. Same as 91:307.

144:210 Hard Cases: Science Policy and Values **2-4 s.h.**
Major issues in practical ethics examined through difficult case studies in fields such as law, medicine, business, and politics; readings from classic authors such as Plato, Aristotle, Kant, and Mill; recent contributions from several disciplines. Same as 91:345.

144:211 Native American Law **3 s.h.**
The specialized body of law that has grown up around Native American peoples and their reservations; tribal self-government, jurisdiction, property tenure, hunting and fishing rights, and federal Indian policy. Same as 91:319.

144:212 Law, Medicine, and Public Policy **arr.**
Public policy issues that have both medical/health and legal aspects; focus on the changing legal framework for organization and regulation of health care. Same as 91:660.

PHILOSOPHY

Chair: Richard Fumerton
Professors: Laird Addis, Panayot Butchvarov, Phillip Cummins, James Duerlinger, Richard Fumerton
Associate professors: Evan Fales, Scott MacDonald
Assistant professors: Gregory Landini, David Stern, Guenter Zoeller
Undergraduate degree offered: B.A. in Philosophy
Graduate degrees offered: M.A., Ph.D. in Philosophy

Undergraduate Program

Undergraduate courses in philosophy are designed to impart knowledge of fundamental issues and main developments in philosophy while strengthening logical and analytic skills. A major in philosophy develops abilities useful for graduate or professional work in many fields—law, for example—and for any situation requiring clear, systematic thinking. A graduate degree is necessary for college teaching in philosophy.

Bachelor of Arts

The B.A. degree requires at least 27 semester hours of credit in courses numbered from 26:102 through 26:198 and must include 26:103 Introduction to Symbolic Logic, 26:111 Ancient Philosophy, and either 26:114 Seventeenth-Century Philosophy or 26:116 Eighteenth-Century Philosophy.

The final 12 semester hours of philosophy courses used to complete the departmental requirement must be taken at The University of Iowa.

In addition to prerequisites listed for individual courses, considerations such as the order in which historical courses are taken are relevant to the effective structuring of a major's undergraduate education. The director of undergraduate studies can provide more information.

Minor

In order to achieve a minor in philosophy, a student must complete a minimum of 15 semester hours in philosophy courses with a 2.00 minimum grade-point average. Of these, a minimum of 12 semester hours must be in courses that are numbered above 100 and are taught in the Department of Philosophy at The University of Iowa. The director of undergraduate studies can provide more information.

Honors Program

The department administers an honors program for undergraduate students of superior ability. In order to be admitted to the honors program in philosophy, a student must be registered in the College of Liberal Arts Honors Program and must have taken and passed at least three philosophy courses for the major. In order to graduate with honors in philosophy, the student must complete the regular requirements for an undergraduate major in philosophy with a grade-point average of at least 3.40 in philosophy courses and must write an acceptable honors thesis on a significant topic in philosophy that interests him or her. The director of undergraduate studies can provide more information.

Graduate Programs

The graduate program is designed to train teachers and scholars in philosophy. The main areas in the graduate curriculum are metaphysics, epistemology, history of philosophy, ethics, logic, and philosophy of science.

Master of Arts

The M.A. degree requires a minimum of 30 semester hours and may be taken without thesis. Requirements include courses in metaphysics and epistemology, history of philosophy, logic and philosophy of science, and ethics. An oral final examination also is required. There is no foreign language requirement. The director of graduate studies can provide more information.

Doctor of Philosophy

The Ph.D. degree requires a minimum of 72 semester hours of graduate credit by the time the dissertation is completed. Candidacy for the doctoral program is determined by a formal vote of the entire faculty of the Department of Philosophy, usually after the student has completed

three semesters of graduate study in residence.

Requirements include courses in metaphysics and epistemology, history of philosophy, logic and philosophy of science, and ethics. Also required is a written comprehensive examination consisting of a dissertation area examination, a special area examination, and a prospectus of the dissertation. The comprehensive examination may be taken only after the student has shown competence in French, German, Greek, or Latin. The director of graduate studies can provide more information.

Courses

More detailed descriptions of undergraduate and graduate courses offered during a given semester or summer session are available in the Department of Philosophy main office, 269 English-Philosophy Building, shortly before early registration.

For Undergraduates Only

26:1 Problems of Moral Reasoning 3 s.h.
Philosophical introduction to ethical thought with emphasis on its implications for contemporary moral controversies.

26:3 Problems of Political Philosophy 3 s.h.
Philosophical study of the good society and the relations of the individual to the state.

26:33 Philosophy and Human Nature 3 s.h.
Philosophical and historical treatment of recent theories of human nature and its relation to society, knowledge, religion, science, and freedom. GER: historical perspectives.

26:34 Philosophy and Human Nature 3 s.h.
Theories of the nature of individuals and governments and the obligations they have to each other; theories examined in the historical and intellectual contexts in which they were expressed. GER: historical perspectives.

26:36 Principles of Reasoning 3 s.h.
Introductory study of logic and its applications. GER: quantitative or formal reasoning.

26:61 Introduction to Philosophy 3 s.h.
Introductory study and discussion of philosophical issues and arguments; topics may include rational belief, evidence, the self, causation, and the presuppositions of religion. GER: humanities.

For Undergraduates and Graduates

Not open to freshmen.

26:102 Introduction to Ethics 3 s.h.
Analytical and historical introduction to ethical theories about issues such as the nature of goodness and the nature of right conduct. GER: humanities.

26:103 Introduction to Symbolic Logic 3 s.h.
Main ideas and basic techniques of modern symbolic logic.

26:104 Introduction to Philosophy of Science 3 s.h.
Main issues in contemporary philosophy of science.

26:111 Ancient Philosophy 3 s.h.
Main trends and major figures such as Plato and Aristotle.

26:112 Medieval Philosophy 3 s.h.
Main trends and major figures such as Augustine and Aquinas.

26:114 Seventeenth-Century Philosophy 3 s.h.
Main trends, central arguments, and major positions from Bacon and Descartes to Leibniz and Locke.

26:116 Eighteenth-Century Philosophy 3 s.h.
Main trends, central arguments, and major positions from Berkeley to Kant.

26:117 Nineteenth-Century Philosophy 3 s.h.
Main trends and major figures of nineteenth-century philosophy.

26:118 Twentieth-Century Philosophy 3 s.h.
Main trends and major figures of twentieth-century analytic philosophy.

26:125 American Philosophy 3 s.h.
Important ideas in American philosophy, including those of Peirce, James, and Dewey, the three leading pragmatists.

26:131 Aesthetics 3 s.h.
Major problems in philosophy of the arts.

26:132 Political Philosophy 3 s.h.
Major problems in political philosophy.

26:133 Philosophy of History 3 s.h.
Major problems in philosophy of history.

26:134 Philosophy of Religion 3 s.h.
Major problems in philosophy of religion. Same as 32:146.

26:136 Philosophy of Literature 3 s.h.
Philosophical dimensions of literature and literary criticism. Same as 48:136.

26:138 Philosophical Problems of Artificial Intelligence 3 s.h.
Major problems of artificial intelligence.

26:141 Existentialist Philosophy 3 s.h.
Main ideas of existentialism, stressing Kierkegaard, Nietzsche, Heidegger, and Sartre.

26:143 Philosophy East and West 3 s.h.
Comparative analysis of ideas in Eastern and Western philosophy.

26:144 Indian Philosophy 3 s.h.
Main ideas and major texts.

26:145 Buddhist Philosophy 3 s.h.
Introduction to the main ideas of Buddhist philosophy.

26:148 Readings in Philosophy arr.
Primarily for honors students. May be repeated for a maximum of 6 s.h.

26:149 Undergraduate Seminar in Philosophy 3 s.h.
Intensive small-group discussion of selected philosophical problems. Consent of instructor required.

26:151 Topics in Ancient Philosophy 3 s.h.
Intensive study of a single ancient philosopher or philosophical problem. Consent of instructor required.

26:152 Plato 3 s.h.
Analysis of main ideas and major texts. Consent of instructor required.

26:153 Aristotle 3 s.h.
Analysis of main ideas and major texts. Consent of instructor required.

26:155 Aquinas, Scotus, Ockham 3 s.h.
Philosophical views of one or more of these and possibly some other important philosophers of the Middle Ages; some attention given to the general philosophical trends of the period. Consent of instructor required.

26:158 Descartes 3 s.h.
Major works, such as the *Discourse on Method*, as well as lesser known works, such as *The World*. Consent of instructor required.

26:160 Spinoza and Leibniz 3 s.h.
Analysis of main ideas and major texts. Consent of instructor required.

26:162 Locke 3 s.h.
An in-depth treatment of Locke's metaphysical and epistemological views in their historical context. Consent of instructor required.

26:163 Berkeley 3 s.h.
Immaterialism and its development. Consent of instructor required.

26:164 Hume 3 s.h.
Major works in a variety of areas, including epistemology, metaphysics, ethics, and philosophy of religion. Consent of instructor required.

26:166 Kant I 3 s.h.
Analysis of main ideas and major texts of Kant's metaphysics and epistemology. Consent of instructor required.

26:167 Kant II 3 s.h.
Analysis of main ideas and major texts of Kant's ethics and aesthetics. Consent of instructor required.

26:169 Fichte, Schelling, Hegel 3 s.h.
Analysis of main ideas and major texts. Prerequisite: 26:114 or consent of instructor.

26:172 Brentano, Meinong, Husserl 3 s.h.
Analysis of main ideas and major texts. Consent of instructor required.

26:173 Heidegger 3 s.h.
Critical analysis of Heidegger's major writings in their relation to the metaphysical and epistemological tradition. Consent of instructor required.

26:174 Sartre 3 s.h.
Phenomenological and existentialist works. Consent of instructor required.

26:177 Wittgenstein 3 s.h.
Analysis of main ideas and major texts. Consent of instructor required.

26:180 Analytic Ethics 3 s.h.
Selected topics in contemporary ethics. Consent of instructor required.

26:182 History of Ethics 3 s.h.
Selected topics in the history of philosophical ethics. Consent of instructor required.

26:184 Moore, Prichard, Ross 3 s.h.
A study of twentieth-century intuitionist ethics, with special attention to the epistemological questions it raises. Consent of instructor required.

26:186 Metaphysics 3 s.h.
A systematic examination of fundamental metaphysical topics through reading and discussion of seminal works, both classical and contemporary. Consent of instructor required.

26:187 Epistemology 3 s.h.
Selected problems in contemporary theory of knowledge. Consent of instructor required.

26:188 Philosophy of Mind 3 s.h.
Selected topics in contemporary philosophy of mind. Consent of instructor required.

26:189 Philosophy of Language 3 s.h.
Selected topics in contemporary philosophy of language. Consent of instructor required. Same as 103:163.

26:191 Mathematical Logic 3 s.h.
Presentation of central metatheorems relating to decidability, computability, completeness, and model theory; treatment of second-order logic. Consent of instructor required.

26:192 Modal Logic 3 s.h.
Formal techniques of modal logic developed and applied to problems in linguistic analysis and modal semantics, with discussion of related philosophical issues. Consent of instructor required.

26:194 Philosophy of Science 3 s.h.
Discussion of central topics in philosophy of science—for example, scientific explanation, confirmation, and the meaning of scientific theories; survey of major twentieth-century developments in these areas. Consent of instructor required.

26:196 Philosophy of the Human Sciences 3 s.h.
Explanation and understanding, theories and reduction, values and ideology, freedom and causality. Consent of instructor required.

26:198 Topics in Philosophy 3 s.h.
Intensive study of a single philosopher or philosophical problem. Consent of instructor required.

Primarily for Graduates

26:221 Seminar: Metaphysics 3 s.h.
May be repeated.

26:222 Seminar: Epistemology 3 s.h.
May be repeated.

26:223 Seminar: Philosophical Analysis 3 s.h.
May be repeated.

26:224 Seminar: Philosophy of Science 3 s.h.
May be repeated.

26:225 Seminar: Philosophy of Religion 3 s.h.
May be repeated.

26:226 Seminar: Ethics 3 s.h.
May be repeated.

26:227 Seminar: Ancient Philosophy 3 s.h.
May be repeated.

26:228 Seminar: Medieval Philosophy 3 s.h.
May be repeated.

26:229 Seminar: Modern Philosophy 3 s.h.
May be repeated.

26:230 Special Research Seminar 3 s.h.
May be repeated.

26:245 Research: Value Theory arr.
May be repeated.

26:247 Research: Metaphysics and Epistemology arr.
May be repeated.

26:249 Research: Logic and Philosophy of Science arr.
May be repeated.

26:251 Research: History of Philosophy arr.
May be repeated.

26:253 Thesis arr.
May be repeated.

DIVISION OF PHYSICAL EDUCATION

Acting director: Alicia Brown
Undergraduate degrees offered: B.A., B.S.
Graduate degrees offered: M.A., Ph.D.

The Division of Physical Education consists of three academic departments—exercise science, leisure studies, and physical education and sports studies—and two programs within physical education skills and teacher preparation. Each department has a separate section in the *Catalog* that describes its program requirements and course offerings.

PHYSICAL EDUCATION SKILLS PROGRAM

Chair: Hilary Hay

This program offers courses that satisfy a portion of the General Education Requirements of the College of Liberal Arts. These requirements are discussed in the College of Liberal Arts section of the *Catalog*. Also see "Nondepartmental Courses" in the same section of the *Catalog*. The faculty of this program is drawn from departments within the Division of Physical Education.

Courses

10:41-42 Physical Education Skills 1 s.h.
Basic and advanced instruction in the student's choice from a wide variety of team and individual sports and physical and recreational activities; emphasis on life span sports and activities. See current *Schedule of Courses* for skills sections offered. GER: physical education.

10:45 Fitness and Wellness for Life 2 s.h.
Lecture material applied to the design of a personalized fitness/wellness program in discussion and laboratory sessions. GER: physical education.

EXERCISE SCIENCE

Chair: Jerry A. Maynard
Professors: James G. Andrews, Gene M. Asprey, Donald R. Casady, Carl V. Gisolfi, James G. Hay, Jerry A. Maynard
Professor emeritus: Louis E. Alley
Associate professors: Gary F. Hansen, David K. Leslie, Kenneth E. Mobily
Associate professors emeriti: N. Richard Hozaepfel, Donald D. Klotz, Arthur J. Wendler
Assistant professors: Thomas W. Balon, Kelly J. Cole, Warren G. Darling
Assistants in instruction: Duane D. Banks, Gary E. Close, Danny T. Foster, Mark A. Johnson, Robert Loll, Paul T. Longo, Glenn S. Patton, Warren G. Slebos, Theodore S. Wheeler
Athletic training clinical assistants: Ann E. Bartels, Russell M. Haynes, James E. Hoegh, Larry J. Leverenz, Faye L. Thompson
Undergraduate degrees offered: B.S. in Exercise Science, Physical Education
Graduate degrees offered: M.A., Ph.D. in Physical Education, Ph.D. in Physical Education (Exercise Science)

The Department of Exercise Science offers Bachelor of Science degree programs in both exercise science and physical education. The graduate program includes the Master of Arts degree without thesis, the Master of Arts degree with thesis, and the Ph.D. degree. Students may select from nine different areas of specialization for the M.A. with thesis and the Ph.D.

Undergraduate Programs

Bachelor of Science degree programs provide preparation for continuing education at the graduate level in exercise science or physical education and for careers in physical education and/or athletic training.

Candidates for the B.S. degree in exercise science are expected to satisfy the College of Liberal Arts General Education Requirement in natural sciences by taking 4:13-14 Chemistry and 37:3 Principles of Animal Biology. The social sciences General Education Requirement should be satisfied by taking 31:3 General Psychology.

Candidates for the B.S. degree in physical education are expected to satisfy the College of Liberal Arts General Education Requirement in natural sciences by taking Chemistry 4:7 and Animal Biology 37:1. The social sciences General Education Requirement should be satisfied by taking 31:1 Elementary Psychology.

Bachelor of Science in Exercise Science

The exercise science major is designed primarily for students who intend to pursue advanced degrees in an exercise science specialization or to seek admittance to a professional program in the health sciences (e.g., medicine, dentistry, or physical therapy). The subspecialties in the program are anatomy, biomechanics, exercise physiology, and motor control.

Qualifications for admission to the major program include completion of a minimum of 60 semester hours of course work with a cumulative grade-point average of 2.75 or higher, and attainment of a cumulative grade-point average of 3.00 or higher for the following courses: 10:1 and 10:2, or 10:3; 4:13; 22M:16 or 22M:25; 31:1; and 37:3.

Exercise science majors must complete the following core courses plus 17 semester hours in their elected subspecialty.

4:14 Principles of Chemistry II 3 s.h.

7P:143 Introduction to Statistical Methods 3 s.h.
or
22S:102 Introduction to Statistical Methods 3 s.h.
or
22S:101 Biostatistics 3 s.h.

22C:7 Introduction to Computing with FORTRAN 3 s.h.
or
6K:70 Computer Analysis 3 s.h.

29:11 College Physics 4 s.h.
29:12 College Physics 4 s.h.
37:3 Principles of Animal Biology 5 s.h.

72:130 Human Physiology 4 s.h.
or
72:150 Intermediate Physiology 4 s.h.

The following courses should be completed prior to the senior year.

27:150 Gross Anatomy for Exercise Science 2 s.h.
27:151 Gross Anatomy Lab for Exercise Science 2 s.h.
27:197 Biomechanics of Human Motion 4 s.h.
27:141 Exercise Physiology 3 s.h.
27:142 Exercise Physiology Laboratory 1 s.h.
27:160 Motor Control I: Neurophysiological Basis 3 s.h.

Course electives for the 17 semester hours in the subspecialties in exercise science are listed below.

Anatomy Specialization

27:153 Advanced Anatomy and Kinesiology 2 s.h.
27:155 Skeletal Muscle Biology 3 s.h.
27:157 The Qualitative Analysis of Human Motion 3 s.h.
27:196 Exercise Science Senior Seminar 2-3 s.h.
37:112 Cell, Tissue, and Organ Biology 5 s.h.
27:253 Laboratory in Advanced Anatomy 6 s.h.

Preprofessional students should take the following in place of 27:253 Advanced Anatomy Laboratory.

37:150 Introductory Endocrinology 2 s.h.
and

37:152 Endocrinology Laboratory 2 s.h.

Biomechanics Specialization

57:7 Statics 2 s.h.
22M:26 Calculus II 4 s.h.
or
22M:36 Engineering Calculus II 4 s.h.
27:155 Skeletal Muscle Biology 3 s.h.
27:157 The Qualitative Analysis of Human Motion 3 s.h.
27:196 Exercise Science Senior Seminar 2-3 s.h.
57:10 Dynamics 3 s.h.
57:19 Mechanics of Deformable Bodies 3 s.h.

Exercise Physiology Specialization

4:121 Organic Chemistry I 3 s.h.
4:122 Organic Chemistry II 3 s.h.
27:155 Skeletal Muscle Biology 3 s.h.
27:196 Exercise Science Senior Seminar 2-3 s.h.
37:150 Introductory Endocrinology 2 s.h.
37:152 Endocrinology Laboratory 2 s.h.
99:110 Biochemistry 3 s.h.

Motor Control Specialization

27:153 Advanced Anatomy and Kinesiology 2 s.h.
27:155 Skeletal Muscle Biology 3 s.h.
27:157 The Qualitative Analysis of Human Motion 3 s.h.
31:126 Physiological Psychology and Psychobiology 3 s.h.
27:196 Exercise Science Senior Seminar 2-3 s.h.
37:40 Biology of the Brain 3 s.h.
37:105 Cell Physiology 4 s.h.
37:112 Cell, Tissue, and Organ Biology 5 s.h.
37:180 Introduction to the Neurosciences 3 s.h.
37:181 Neurophysiology 3 s.h.

Bachelor of Science in Physical Education

The B.S. degree in physical education is offered as a general major.

Students must complete the following core requirements plus additional courses in the elected emphasis. Athletic training program students are exempt from the core requirements.

27:22 Skill Component in Physical Education II 2 s.h.
27:23 Skill Component in Physical Education III 4 s.h.
27:53 Human Anatomy 3 s.h.
27:56 First Aid and CPR (Same as 28:37, 138:37) 2 s.h.
27:57 Basic Athletic Training 3 s.h.
27:107 Biomechanics of Physical Education 3 s.h.
138:108 Motor Learning and Motor Control 3 s.h.
138:71 Human Growth and Motor Development 2 s.h.
27:140 Exercise Physiology for Practitioners 3 s.h.
72:130 Human Physiology 4 s.h.

General Major

Students who elect the general major in physical education must complete the core requirements listed above and the following courses:

138:103 Administration of Physical Education and Athletics 2-3 s.h.
27:105 Physical Education for the Handicapped (Same as 138:105) 3 s.h.
28:83 Psycho-Social Dimensions of Physical Activity 3 s.h.
138:142 Contemporary Issues of Health Education 3 s.h.

Athletic Training Program

The athletic training program provides concentrated studies and clinical experiences leading to National Athletic Training Association certification in athletic training. Employment opportunities for graduates include serving as trainers for professional teams as well as university, college, and secondary school athletic teams. Teacher certification is recommended but not required.

Students who have not formally contacted the athletic training program director prior to enrolling at The University of Iowa should talk to an athletic training adviser or their college adviser upon entering the University. Early advising should be sought for course counseling since prerequisite and sequenced skill development must be completed along with general education course work.

Students are formally admitted into the program and begin clinical experience as sophomores. Application is made between January 1 and April 1 of the freshman year. To be considered for admission, students must be certified in first aid and CPR and must complete at least one college-level course in each of the following areas: animal biology, chemistry, mathematics, physics, introductory psychology, human anatomy, human growth and development, and introductory athletic training.

Program requirements include:

7C:199 Counseling for Related Professions 3 s.h.
17:41 Introductory Nutrition 3 s.h.
138:142 Contemporary Issues of Health Education 3 s.h.
71:120 Drugs: Their Nature, Action, and Use 2 s.h.
72:130 Human Physiology 4 s.h.
27:140/141 Exercise Physiology 3 s.h.
27:160 Motor Control I: Neurophysiological Basis 3 s.h.
27:107/197 Biomechanics 3 s.h.
*27:171 Administration of Athletic Training Programs 3 s.h.
*27:182 Clinical Sciences in Athletic Training I 3 s.h.
*27:183 Clinical Sciences in Athletic Training II 3 s.h.
*27:184 Seminar in Athletic Training 9 s.h.
27:253 Laboratory in Advanced Anatomy 6 s.h.
EMT-A or comparable emergency care certification

*Enrollment is limited to students formally admitted to the athletic training program.

Minor in Physical Education

The minor in physical education requires at least 15 semester hours with a minimum grade-point average of 2.00. Twelve of the 15 semester hours must be earned in upper division courses at The University of Iowa. It is recommended that the selection be made from the courses listed below.

138:103 Administration of Physical Education and Athletics 3 s.h.
138:71 Human Growth and Motor Development 2 s.h.
27:107 Biomechanics of Physical Education 3 s.h.
138:108 Motor Learning and Motor Control 3 s.h.
27:140 Exercise Physiology for Practitioners 3 s.h.
27:53 Human Anatomy 3 s.h.
28:83 Psycho-Social Dimensions of Physical Activity 3 s.h.
27:167 Measurement and Evaluation in Physical Education (Same as 138:167) 3 s.h.

No course accepted toward the minor may be taken pass/nonpass.

Graduate Programs

Master of Arts without Thesis

The program leading to the M.A. degree without thesis is designed as a terminal unit of advanced study for physical education teachers and athletics coaches. Emphasis is on applying research findings to the organization, teaching, and evaluation of basic physical education programs for all students in schools and colleges, and to coaching interscholastic and intercollegiate athletic teams. The program focuses on problems associated with teaching and coaching in public schools and community colleges.

The following undergraduate course work is required background for the nonthesis M.A. program in physical education.

Human anatomy 3 s.h.
Human physiology 3 s.h.
Personal health (or equivalent) 2 s.h.
Administration of physical education and athletics 2 s.h.
Methods in physical education 2 s.h.
Practice teaching (or equivalent) 3 s.h.
Teaching of skills in physical education 4 s.h.
Coaching of a sport 1 s.h.
Electives in physical education and related areas 11 s.h.
Total 30 s.h.

For the M.A. degree without thesis, students must complete a minimum of 30 semester

hours. At least 24 must be in physical education, including 27:301 Non-Thesis Seminar, and at least one course must be chosen from each of these three groups:

Group 1

27:105 Physical Education for the Handicapped 3 s.h.
or
27:167 Measurement and Evaluation in Physical Education 3 s.h.

Group 2

27:237 Public School Curriculum in Physical Education 2-3 s.h.
or
27:242 Supervision of Physical Education 3 s.h.

Group 3

27:140 Exercise Physiology for Practitioners 3 s.h.
or
27:150 Gross Anatomy for Exercise Science 2 s.h.
and
27:151 Gross Anatomy Lab for Exercise Science 2 s.h.
or
27:157 The Qualitative Analysis of Human Motion 3 s.h.
or
27:160 Motor Control I: Neurophysiological Basis 3 s.h.

Master of Arts with Thesis

The thesis program leading to the M.A. degree in exercise science or physical education is designed primarily as a first step in graduate study leading to the doctor of philosophy. It also provides advanced preparation for persons who are teaching or who intend to teach undergraduate physical education in four-year colleges but do not plan to pursue doctorates.

The thesis program for the M.A. degree in exercise science or physical education is a research-oriented program. It introduces students to the nature and extent of research in exercise science and physical education, and gives them an opportunity to specialize in an area of interest.

Because the M.A. degree with thesis is regarded as the first step toward the Ph.D. degree in one of nine areas of specialization, the undergraduate course work required depends on the area in which the candidate intends to specialize for doctoral study. Specific courses in mathematics, chemistry, physics, biology, physiology, or psychology are required in some areas of specialization. These courses must be approved by the M.A. adviser and the professor in charge of the emphasis area selected by the candidate.

The following courses are required for the M.A. degree with thesis:

Two courses outside the area of specialization, from the following:

27:141 Exercise Physiology 3 s.h.
and
27:142 Exercise Physiology Laboratory 1 s.h.

27:153 Advanced Anatomy and Kinesiology 2 s.h.
27:197 Biomechanics of Human Motion 4 s.h.
27:205 Adapted Physical Education: Special Topics and Research 3-4 s.h.
27:237 Public School Curriculum in Physical Education 2-3 s.h.
27:242 Supervision of Physical Education 3 s.h.
27:267 Advanced Measurement and Evaluation in Physical Education 3 s.h.

Three courses related to basic research tools, from the following:

7P:143 Introduction to Statistical Methods 3 s.h.
or
63:161 Introduction to Biostatistics 3 s.h.

An approved graduate-level course in computer science 2-4 s.h.
An approved graduate-level course in scientific writing 3 s.h.

Specialization area:

27:404 Thesis: M.A. 4 s.h.
Specialization courses approved by adviser 5-7 s.h.
Electives 4-5 s.h.

Total 30 s.h.

Doctor of Philosophy

Admission

Admission to the Ph.D. program is based on applicants' grade-point average on work completed for the M.A. or M.S. degree and their score on the Graduate Record Examination (GRE) General Test. To be considered for admission, applicants must have earned a grade-point average of 3.00 or higher on all graduate work.

For admission to the Ph.D. program in therapeutics, applicants must be graduates of an approved professional program in physical therapy and must hold a master's degree, which need not be in physical therapy. Deadlines for admission applications are October 15, March 15, and May 15; notification is made approximately two months after the respective application deadline.

Requirements

Ph.D. candidates should have a general knowledge of all areas in exercise science and physical education, a working knowledge of research techniques applicable to problems in the field, and an in-depth knowledge in at least one area of specialization in exercise science or physical education.

Specialization areas offered include adapted physical education; administration, curriculum, and supervision in physical education; anatomy; biomechanics; exercise physiology; measurement and evaluation in physical education; motor control; and therapeutics.

The thesis program for the M.A. degree, together with the Ph.D. core courses, provide the required background for the Ph.D. candidate's specialization. Candidates must complete a minimum of 72 semester hours beyond the B.A. or B.S. degree. This must include the completion of a dissertation on a problem in the area of specialization. It is expected that an appropriate manuscript of the dissertation will be submitted to an approved professional journal for publication.

Many of the courses in the specialization areas are offered by departments other than the Department of Exercise Science. Professors from these departments frequently serve on comprehensive examination committees and on dissertation committees for the initial presentation of the candidate's proposed problem. They also participate in the final oral examination in which the candidate defends the dissertation.

General Requirements

Ph.D. candidates must fulfill the following requirements:

Completion of the M.A. or M.S. degree with thesis; this may or may not include The University of Iowa M.A./M.S. degree requirements in the Department of Exercise Science;

Ph.D. degree courses include a minimum of 10 semester hours of independent research exclusive of the thesis requirement; the intent of the independent study is to provide students with additional opportunities to conduct research projects; students are encouraged to submit such completed projects for publication;

At least 72 semester hours of graduate credits beyond the B.A. degree; Ph.D. degrees in exercise science typically exceed 90 semester hours.

Core Course Requirements

Two approved courses in statistics
One approved computer science course
27:202 Practicum in College Teaching (minimum of 3 s.h.)
27:201 Research (minimum of 10 s.h.)
27:405 Thesis: Ph.D. (12 s.h.)

In order to ensure that exercise science majors obtain a minimal breadth of knowledge over the key scientific areas that constitute the basis of the major, the following scientific area course requirements must be satisfied.

Students specializing in anatomy, biomechanics, exercise physiology, and motor control must select one course from each of the four areas below. Three must be second-level courses.

Students specializing in other areas must select one course in three of the four areas. Two must be second-level courses.

Students specializing in therapeutics may submit a formal request to the Exercise Science faculty to substitute specific courses from their program for the scientific area courses listed below, provided the substitute courses contain both a lecture and a laboratory format.

Anatomy
First-level: 27:150 and 27:151 (4 s.h.)
Second-level: 27:253 (6 s.h.)
Biomechanics
First-level: 27:107 (3 s.h.)
Second-level: 27:197 (4 s.h.)
Motor Control
First-level: 27:108 (3 s.h.)
Second-level: 27:160 (3 s.h.)
Exercise Physiology
First-level: 27:141 and 27:142 (4 s.h.)
Second-level: 27:274 and 27:303, or 27:275 and 27:304, or 27:276 and 27:305 (3 s.h.)

Qualifying and Comprehensive Examinations

To assess general background knowledge, all Ph.D. candidates must pass an initial qualifying examination, which should be taken prior to the third semester of graduate study (prior to the fifth semester if the student entered with only a bachelor's degree). Ph.D. candidates also must pass a comprehensive examination, which should be taken following the completion of the fourth semester of graduate study (sixth for students entering with only the bachelor's degree). Candidates specializing in exercise physiology who wish a minor in physiology may write a separate comprehensive examination prepared and evaluated by faculty members of the Department of Physiology and Biophysics in the College of Medicine.

Candidates are expected to obtain a broad knowledge base within their area of specialization. This normally entails approximately 30 semester hours. Recommended courses for each area of specialization are as follows:

Adapted Physical Education

7U:130 Exceptional Persons	3 s.h.
27:205 Adapted Physical Education: Special Topics and Research	3-4 s.h.
60:108 Human Anatomy	4 s.h.
27:253 Laboratory in Advanced Anatomy	6 s.h.

Administration, Curriculum, and Supervision

27:242 Supervision of Physical Education	3 s.h.
7D:201 Foundations of School Administration	3 s.h.
27:207 Advanced Administration of Physical Education	3 s.h.
27:337 Seminar: Research Models and Theory in Physical Education Curriculum	3 s.h.

Anatomy

27:253 Laboratory in Advanced Anatomy	6 s.h.
60:217 Developmental Anatomy	2 s.h.
60:234 Medical Neuroscience	4 s.h.
37:112 Cell, Tissue, and Organ Biology	5 s.h.
27:153 Advanced Anatomy and Kinesiology	2 s.h.
99:120 Biochemistry and Molecular Biology I	4 s.h.
27:295 Electromyography in Kinesiology and Biomechanics	3 s.h.
99:130 Biochemistry and Molecular Biology II	4 s.h.
99:110 Biochemistry	3 s.h.
77:103 Introduction to Radionuclides and Radiobiology	4 s.h.
77:224 Radioisotopes in Biological Research	4 s.h.

Biomechanics

57:19 Mechanics of Deformable Bodies	3 s.h.
57:20 Mechanics of Fluids and Transfer Processes	4 s.h.
57:21 Principles of Design I	3 s.h.
58:155 Intermediate Dynamics	3 s.h.
63:162 Design and Analysis of Experiments in the Biomedical Sciences	3 s.h.
27:253 Laboratory in Advanced Anatomy	6 s.h.
27:295 Electromyography in Kinesiology and Biomechanics	3 s.h.
27:357 Research Techniques in Biomechanics	4 s.h.
101:212 Biomedical Instrumentation	3 s.h.

Exercise Physiology

37:112 Cell, Tissue, and Organ Biology	5 s.h.
or	
60:205 General Histology for Graduate Students	4 s.h.
37:150 Introductory Endocrinology	2 s.h.
37:152 Endocrinology Laboratory	2 s.h.
71:105 Pharmacology for Health Sciences Medical	5 s.h.
72:212 Medical Physiology	6 s.h.
72:274 Exercise Physiology Seminar	2 s.h.
99:120 Biochemistry and Molecular Biology I	4 s.h.
99:130 Biochemistry and Molecular Biology II	4 s.h.
72:234 Medical Neuroscience	4 s.h.
77:103 Introduction to Radionuclides and Radiobiology	4 s.h.
77:224 Radioisotopes in Biological Research	4 s.h.

Measurement and Evaluation

7P:243 Intermediate Statistical Methods	4 s.h.
and	
7P:244 Correlation and Regression	3 s.h.
or	
22S:153 Introduction to Probability	3 s.h.
and	
22S:154 Introduction to Mathematical Statistics	3 s.h.
7P:246 Design of Experiments	4 s.h.
7P:255 Construction and Use of Evaluation Instruments	3 s.h.
7P:257 Educational Measurement and Evaluation	3 s.h.
27:367 Seminar: Research in Measurement and Evaluation in Physical Education	arr.

Motor Control

27:295 Electromyography in Kinesiology and Biomechanics	3 s.h.
27:314 Seminar in Motor Control	2 s.h.
37:180 Introduction to the Neurosciences	3 s.h.
101:212 Biomedical Instrumentation	arr.

Three courses must be selected from the following areas: computer science, neuroscience, biomechanics, anatomy, and exercise science.

Therapeutics

Candidates for this specialization must be accepted into the graduate program in physical therapy education as well as in exercise science. Prerequisites are listed under required courses for the Master of Arts in physical therapy under "Division of Associated Medical Sciences" in the "College of Medicine" section of the *Catalog*. Students specializing in therapeutics must satisfy the scientific area course requirements listed for the exercise science major.

General Core

22C:100 Introduction to Computing with Fortran	2 s.h.
63:273 Research Data Management	3 s.h.
or	
7P:248 Data Processing	3 s.h.
27:405 Thesis: Ph.D.	12 s.h.
101:214 Advanced Seminar in Physical Therapy	3 s.h.
101:280 Teaching Practicum	3 s.h.
Total	23 s.h.

Research

27:201 Research	arr.
101:284 Practicum in Research	arr.
101:325 Independent Study	arr.
101:327 Research in Therapeutics	arr.
Total	10 s.h.

Specialty Emphasis

Individual plans of study are developed jointly by the graduate student and faculty adviser. Course requirements depend on the student's specific specialty area (cardiopulmonary, ergonomics, musculoskeletal, neuromuscular).

Facilities

The Field House, Recreation Builiding, and Indoor Practice Facility provide excellent facilities for the physical education skills program and the undergraduate and graduate instructional programs.

Research laboratories for anatomy, biomechanics, physiology of exercise, and motor control are located in the Field House and in other buildings on campus. They provide excellent facilities for instruction and research at both the undergraduate and graduate levels.

Cooperative efforts with other departments facilitate specialization by allowing exercise science and physical education students to use additional special facilities and research

equipment in other departments on campus.

Courses

Primarily for Undergraduates

27:000 Cooperative Education Internship 0 s.h.

27:1 Skill Acquisition in Physical Education 0-1 s.h.
Approximately 60 activities are offered. Meets first eight weeks of the semester. Open only to Division of Physical Education majors.

27:2 Skill Acquisition in Physical Education 0-1 s.h.
Continuation of 27:1, but may be taken independently; classes meet last half of the semester. Open only to Division of Physical Education majors.

27:6 Advanced Rock Climbing Trip 1 s.h.
Week-long rock climbing short course at Devil's Lake, Wisconsin, in May and August conducted by the Iowa Mountaineers.

27:7 Grand Canyon Hiking Trip 1 s.h.
Week-long hiking and camping in Grand Canyon conducted in March by the Iowa Mountaineers.

27:8 Cross-Country Skiing Trip 1 s.h.
Week-long cross-country skiing trip to Colorado conducted in December and January by the Iowa Mountaineers.

27:11 Orientation to Physical Education 0 s.h.

27:21 Skill Component in Physical Education I 2 s.h.
Theory, principles, and evaluation of aerobics and health-related fitness activities. Offered fall semesters.

27:22 Skill Component in Physical Education II 2 s.h.
Offered spring semesters.

27:23 Skill Component in Physical Education III 4 s.h.
Offered during May interim.

27:42 Officiating of Football, Basketball, and Baseball 2 s.h.
Officiating high school football, basketball, and baseball; rules, rule interpretations, and mechanics of officiating. Students may earn certification in high school officiating through the course. Offered fall semesters.

27:43 Administration of Intramural Athletics 2 s.h.
Offered spring semesters.

27:53 Human Anatomy 3 s.h.
General human anatomy covering all systems of the body; for students majoring in physical education and athletic coaching or planning careers in the health professions. Same as 28:80, 138:53.

27:56 First Aid and CPR 2 s.h.
American Red Cross certification: basic first aid and CPR procedures. Same as 28:37, 138:37.

27:57 Basic Athletic Training 3 s.h.
Training techniques and modalities for prevention and rehabilitation of athletic injuries. Prerequisite: 27:53 or 28:80 or 138:53.

27:96 Special Projects arr.

For Undergraduates and Graduates

27:104 Ancient Athletics 2-3 s.h.
Survey of athletics in the ancient world, from Homer and the origins of the Olympic Games through sport in ancient Rome; topics include ancient sports complexes, place of physical education in general education, women's sport, and physical training; readings are in English. Same as 14:104, 28:117.

27:105 Physical Education for the Handicapped 3 s.h.
Orthopaedic impairments, blindness, deafness, mental retardation; information for modifying activities and programming; observations in the public schools; some practicum experience may be included. Prerequisite: 27:53. Same as 138:105.

27:106 Mental Training for Peak Performance 2-3 s.h.
Offered summer sessions through the Saturday and Evening Class Program. Same as 28:114.

27:107 Biomechanics of Physical Education 3 s.h.
Introduction to biomechanical concepts and their application to improving performance in physical education activities.

27:112 Health Promotion and Aging 3 s.h.
Biology of aging; common health problems associated with physical activity levels; physical fitness standards, nutrition, programming, and related organizations.

27:115 Seminar in Adapted Physical Education 2-3 s.h.
Follow-up to introductory courses in adapted physical education; physical, mental, emotional, and learning disabilities; assessment and evaluation procedures; program concepts; modification of activities. Offered spring semesters.

27:137 Physical Education Curriculum: Issues and Trends 3 s.h.
Strategies for the K-12 setting. Same as 7E:137, 7S:137.

27:140 Exercise Physiology for Practitioners 3 s.h.
Effects of acute and chronic exercise on different physiological systems (energy, respiratory, circulatory, endocrine); topics include fitness evaluation, weight-control strategies, training programs. Prepares students for ACSM Fitness Instructor Certification.

27:141 Exercise Physiology 3 s.h.
Effects of acute and chronic exercise on changes and adaptations that occur in the energy, endocrine, respiratory, cardiovascular, renal, and gastrointestinal systems. Offered fall semesters. Prerequisite: 72:130.

27:142 Exercise Physiology Laboratory 1 s.h.
Supplements 27:141; principles of scientific investigation used to demonstrate acute and chronic effects of exercise.

27:150 Gross Anatomy for Exercise Science 2 s.h.
Major systems of the body with emphasis on the nervous, muscular, and connective tissue systems related to movement; lectures. Open only to exercise science majors.

27:151 Gross Anatomy Lab for Exercise Science 2 s.h.
Major systems of the body with emphasis on nervous, cardiovascular, and muscular systems related to movement; laboratory. Open only to exercise science majors.

27:153 Advanced Anatomy and Kinesiology 2 s.h.
Structure, growth, and development of connective, muscular, and nerve tissues from embryologic to adult stages; specific joints, their structure and movements.

27:155 Skeletal Muscle Biology 3 s.h.
Skeletal muscle structure, function, and biomechanical properties; methods of recording muscle activity; interpretation of muscle recordings.

27:157 The Qualitative Analysis of Human Motion 3 s.h.
Application of basic concepts in biomechanics to qualitative analysis of motor skills; analyses are based on development of a deterministic model; observation of performance, identification of faults; establishment of priority among faults; instruction of the performer. Offered summer sessions. Prerequisite: 27:107.

27:160 Motor Control I: Neurophysiological Basis 3 s.h.
Detailed consideration of neurophysiological bases for movement and mechanisms of motor control; neuroanatomical, neurophysiological, and biomechanical bases of motor control; mechanisms and theories that explain control of locomotion and posture, head-eye coordination, control of simple and complex arm and hand movements, and grasp/manipulation.

27:167 Measurement and Evaluation in Physical Education 3 s.h.
Examination and application of a variety of measurement techniques and tests, emphasis on gaining experience in use of cognitive measuring methods and different measures of psychomotor skills, including fitness and sports test batteries. Offered fall semesters. Same as 138:167.

27:169 Leadership Training Internship arr.
Open only to physical education majors. Consent of instructor required.

27:171 Administration of Athletic Training Programs 2-3 s.h.
Health care supervision, professional athletic training responsibilities, and philosophies in athletic health care. Offered spring semesters.

27:182 Clinical Sciences in Athletic Training I 3 s.h.
Theoretical and practical skill development in the areas of orthopaedic evaluation and therapeutic modalities. Open only to athletic training majors. Offered fall semesters. Prerequisite: 27:57.

27:183 Clinical Sciences in Athletic Training II 3 s.h.
Offered spring semesters. Prerequisite: 27:182.

27:184 Seminar in Athletic Training arr.
Current issues and relationships in clinical practice. Open only to athletic training majors. Five consecutive registrations required, for a total of 9 s.h.

27:185 Practicum in EMT-A arr.

27:190 Motor Control II: Human Voluntary Movement 3 s.h.

27:196 Exercise Science Senior Seminar 2-3 s.h.
Independent library or laboratory research in one of four areas of specialization (anatomy, biomechanics, exercise physiology, or motor control; results presented orally and in writing. Open only to exercise science majors.

27:197 Biomechanics of Human Motion 4 s.h.
Application of the principles of mechanics to the investigation of human motion in two dimensions; topics include system modeling, force system and equilibrium analysis, particle and rigid body kinematics, Newton's and Euler's equations of motion, work-energy and impulse-momentum integral principles.

Primarily for Graduates

27:200 Problems arr.

27:201 Research arr.
Consent of department head required.

27:202 Practicum in College Teaching arr.

27:203 Practicum Administration of Physical Education Athletics arr.

27:205 Adapted Physical Education: Special Topics and Research 3-4 s.h.
Offered fall semesters. Prerequisites: 27:53 and 27:105.

27:207 Advanced Administration of Physical Education 3 s.h.
Offered fall semesters.

27:227 Advanced Administration of Athletics 3 s.h.
Offered fall semesters.

27:237 Public School Curriculum in Physical Education 2-3 s.h.
Offered fall semesters. Same as 7E:237, 7S:345.

27:242 Supervision of Physical Education 3 s.h.
Offered fall semesters. Same as 7E:242, 7S:242.

27:253 Laboratory in Advanced Anatomy 6 s.h.

27:258 Seminar: Current Developments in Biomechanics 0 s.h.

27:267 Advanced Measurement and Evaluation in Physical Education 3 s.h.
Offered spring semesters.

27:274 Exercise Physiology Seminar 2 s.h.
Same as 72:274.

27:275 Advanced Exercise Physiology 2 s.h.

27:276 Advanced Exercise Physiology 2 s.h.

27:295 Electromyography in Kinesiology and Biomechanics 3 s.h.
Introduction to electromyographic techniques for studying muscle activity in human motion. Offered spring semesters. Same as 101:295.

27:301 Non-Thesis Seminar 3 s.h.
For candidates for the M.A. without thesis. Offered spring semesters.

27:303 Advanced Exercise Physiology Laboratory 1 s.h.

27:304 Advanced Exercise Physiology Laboratory 1 s.h.

27:305 Advanced Exercise Physiology Laboratory 1 s.h.

27:311 Orientation to Graduate Study 0 s.h.
Offered fall semesters.

27:314 Seminar in Motor Control 2 s.h.
Offered spring semesters.

27:337 Seminar: Research Models and Theory in Physical Education Curriculum 3 s.h.
Offered spring semesters. Prerequisite: 27:237.

27:357 Research Techniques in Biomechanics 4 s.h.
Offered spring semesters.

27:367 Seminar: Research in Measurement and Evaluation in Physical Education arr.

27:401 Seminar in Scientific Writing 2 s.h.

27:404 Thesis: M.A. 0-4 s.h.

27:405 Thesis: Ph.D arr.
Single or repeated registration for up to 12 semester hours.

LEISURE STUDIES

Chair: Kenneth E. Mobily
Professors: Benjamin K. Hunnicutt, John A. Nesbitt, Michael L. Teague
Associate professors: Richard D. MacNeil, Kenneth E. Mobily
Undergraduate degree offered: B.S. in Leisure Studies
Graduate degree offered: M.A. in Leisure Studies

In 1949, The University of Iowa became the first institution of higher education in Iowa to offer courses in leisure studies and in 1960, the first to offer a program in leisure studies. The mission of the Department of Leisure Studies has three major components: liberal education through leisure studies, professional preparation for the leisure service profession, and the research of leisure as a behavioral and cultural phenomenon.

By studying the value and function of leisure in a modern society that is at once blessed and burdened with more free time, the department serves the cause of the liberal arts ideal, a fuller and more humane life.

The Department of Leisure Studies emphasizes the education of all liberal arts students. Specifically, it offers two courses designed to satisfy 3 semester hours of the College of Liberal Arts' General Education Requirements (GER) in the humanities (104:25) and in the social sciences (104:59). Both are intended for all students.

In the past 40 years, the number of people employed in recreation and parks has increased dramatically. There are opportunities for professional placement throughout the United States and abroad in a wide range of public park and recreation settings; voluntary and social agency recreation programs; therapeutic recreation programs; school, military service, commercial, and industrial recreation programs; and teaching and research.

Undergraduate Program

Applicants to the undergraduate program in leisure studies must have a minimum cumulative grade-point average of 2.00 based on at least 15 semester hours of completed course work. They must submit a transcript and a one-page statement of their interest in leisure studies, significant work or volunteer experience, exceptional personal qualities, and other pertinent information. Letters of reference are optional. Applications are available from the departmental office. Deadline for fall semester admission is March 1, for spring semester, October 1.

Requirements

Students must take 34 semester hours of core courses, including:

104:60 Leisure in Contemporary Society 3 s.h.
104:61 Recreation Leadership and Programming 4 s.h.
104:101 Leisure Research 3 s.h.
104:105 Introduction to Therapeutic Recreation 3 s.h.
104:108 Administration of Recreation I 3 s.h.
104:197 Preinternship Seminar 1 s.h.
104:198 Internship in Recreation 7 s.h.
104:199 Internship in Recreation 8 s.h.
27:56 or 28:37 or 138:37 First Aid and CPR 2 s.h.

Students also must take 9-15 semester hours of courses in one of the following areas of concentration.

Community Recreation

The community recreation concentration is designed for students preparing for positions as organizers and administrators of recreation programs, facilities, and departments. It is oriented primarily to municipal, district, and county-level recreation and park departments.

Required courses are:

104:130 Park and Recreation Facility Management 3 s.h.
104:134 Introduction to Planning and Design of Recreation and Park Areas and Facilities 3 s.h.
Three courses selected with adviser

Therapeutic Recreation

Therapeutic recreation prepares students to organize, plan, and lead recreation programs in treatment and nontreatment settings for people who are ill, handicapped, aged, disabled, and disadvantaged.

Required courses are:

104:121 Orientation to Special Populations in Therapeutic Recreation 4 s.h.
104:125 Role of Therapeutic Recreation in Rehabilitation 3 s.h.
Three to six courses, selected with the adviser, that satisfy pre-examination requirements for certification set by the National Council for Therapeutic Recreation Certification.

Leisure Studies

The leisure studies concentration is designed for students preparing for graduate work or who have a major interest in leisure research or leisure as a contemporary social issue. It is the most flexible of all concentrations and makes maximum use of courses outside of the Department of Leisure Studies. Together, the student and adviser design the leisure studies concentration according to individual needs.

Commercial/Industrial

The commercial/industrial track is the newest emphasis area. Students seeking careers in commercial recreation operations, such as health spas and clubs, sales of recreation goods or services, or recreation-related businesses find this specialization well-suited to their needs, as do those interested in industrial recreation and employer-provided recreational services and opportunities for employees. Students are urged to select a combination of guided electives in business, fitness, and health-related areas.

Required courses are:

104:138 Health Promotion in Corporate, Hospital, and Private Settings 3 s.h.
104:139 Managing the Commercial Recreation Enterprise 3 s.h.
Three courses selected with the adviser

Internship Opportunities

The Department of Leisure Studies places special emphasis on practical experience and student involvement with the profession and practitioners. Students are encouraged to attend state and national professional conferences, and many classes in the professional core include lectures by working professionals as well as opportunities for field experience related to course content.

The practical emphasis is completed by a professional internship for a full semester in an agency compatible with the student's area of concentration. The internship is designed to lead to professional placement. Several hundred local, state, and national departments, agencies, and services provide field work and internship opportunities for students in the department.

Honors

Admission to the honors program in leisure studies requires a formal application, completion of at least 30 semester hours of course work at The University of Iowa, completion of at least 9 of the 34 semester

hours of required major course work, and a grade-point average that meets the minimum requirement of the College of Liberal Arts Honors Program.

To graduate with honors in leisure studies, students must successfully complete 6 semester hours of honors work. With the permission of the chair of their honors committee, students may take 3 semester hours of honors work in another department.

Minor

Students wishing to minor in leisure studies may do so by completing a minimum of 15 semester hours in the leisure studies curriculum with a grade-point average of 2.00. Twelve of the 15 semester hours must be taken in advanced (100-level) courses at The University of Iowa. The course selection is determined by student interest and the recommendation of the undergraduate coordinator.

No course accepted toward the minor may be taken pass/nonpass.

Graduate Program

The master's program is designed to prepare students for administrative, supervisory, and teaching positions in recreation systems and in universities. It offers two areas of specialization: public, private, and commercial recreation, and therapeutic recreation administration. It may be taken with thesis (33 semester hours) or without (36 semester hours). An introduction to scholarly activities and research is provided through 104:101 Leisure Research and preparation of a thesis or research problem.

Public, Private, and Commercial Recreation

This area focuses on the development and administration of recreational programs in settings such as municipal departments, schools, voluntary agencies, churches, the armed forces, state and federal agencies, industries, and private organizations. Administration and management are central to this area of study. To support this emphasis, the program draws heavily from other disciplines, such as public administration, urban and regional planning, psychology, sociology, geography, and physical education.

Therapeutic Recreation Administration

Therapeutic recreation relates to the development and administration of programs serving the mentally retarded, physically disabled, emotionally disturbed, and aging in both institutional and community settings.

The program is directed toward understanding recreation's role in a comprehensive rehabilitation process, including both clinical and community facets, and thus prepares the student to work with a broad range of disability areas in either setting. Through the use of related area courses, strengths in specific disability areas may be developed.

Undergraduate preparation in leisure studies is not essential to successful completion of the master's program. Hence, prospective students from diverse backgrounds are encouraged to apply.

Financial Aid

Assistance for graduate students is available in the form of research assistantships and teaching assistantships. Students may apply for assistance through the department.

Facilities

Students majoring in leisure studies have the opportunity to gain extensive experience, paid or voluntary, through independent research in these and other locations: The University of Iowa Psychiatric Hospital and Hospital Schools, The University of Iowa Division of Recreational Services, Iowa City Parks and Recreation Department, Systems Unlimited, various retirement and convalescent homes, and the Coralville Department of Parks and Recreation.

Courses

Primarily for Undergraduates

104:000 Cooperative Education Internship 0 s.h.

104:25 Humanistic Perspectives on Leisure and Play 3 s.h.
Classic writings in the humanities literature reviewed for the purpose of integrating the ideal of a liberal education with the worthy and meaningful use of free time in contemporary society. GER: humanities.

104:59 Social Scientific Perspectives on Leisure and Play 3 s.h.
Relationships between leisure and economics, sociology, and other social sciences; how individual and group behavior is affected during leisure; antecedents, motives, and consequences of leisure behavior. GER: social sciences.

104:60 Leisure in Contemporary Society 3 s.h.
Basic philosophical, historical, and scientific foundations and developments in leisure and recreation; function and settings of organized recreation.

104:61 Recreation Leadership and Programming 4 s.h.
Leadership principles and techniques; programming techniques.

104:112 Introduction to Museology 2 s.h.
Same as 113:103, 97:115, 24:112, 7S:112.

For Undergraduates and Graduates

104:101 Leisure Research 3 s.h.
Research methods presented and applied to leisure research topics; emphasis on processes of research proposal assembly.

104:105 Introduction to Therapeutic Recreation 3 s.h.
Basic concepts of recreation's role in rehabilitation; organization and development of programs, approaches to understanding behavior of patients, and adaptation of activities to basic disability areas.

104:106 Recreation Program 3 s.h.

104:108 Administration of Recreation I 3 s.h.
Programming, personnel, finance and budgets, liability, areas and facilities, and other administrative aspects of recreation.

104:120 Orientation to Rehabilitation Settings 1 s.h.

104:121 Orientation to Special Populations in Therapeutic Recreation 4 s.h.
Human growth and development and the concomitant development of recreation and leisure life-styles among individuals; focus on investigating the developmental patterns of special populations.

104:122 Work and Leisure in American Culture 3 s.h.
Methods and insights of two fields, American studies and leisure studies, combined and applied to the relationship between work and leisure in American life; patterns and perceptions of work and leisure, opinions of what share leisure should or could have; focus on understanding changing American values. Same as 45:170.

104:125 Role of Therapeutic Recreation in Rehabilitation 3 s.h.
Role of therapeutic recreation in total institutional and community rehabilitation efforts; cooperative role of therapeutic recreation in total therapies program.

104:126 Exercise Programs for Special Populations 3 s.h.
General anatomy, general exercise physiology, training principles, common athletic injuries and treatment, common medications, contraindicative exercises, special populations; development, implementation, and instruction of exercise programs, including aerobic dance and classes for special populations.

104:130 Park and Recreation Facility Management 3 s.h.
Introduction to recreation and park facilities management: personnel, program, financing, design, and standards.

104:134 Introduction to Planning and Design of Recreation and Park Areas and Facilities 3 s.h.
Horticulture, floriculture, landscape design, agronomy, and turf management; how they relate to the planning and design of recreation and park areas and facilities.

104:138 Health Promotion in Corporate, Hospital, and Private Settings 3 s.h.
Development and operation of wellness programs in corporations, hospitals, and community outreach centers; program principles, skills, and legal concerns such as stress management, aerobic fitness and testing, nutrition, public relations, and fund drives.

104:139 Managing the Commercial Recreation Enterprise 3 s.h.
Helps students develop the basic managerial skills necessary to keep the small commercial recreation complex operating smoothly and profitably; topics include entrepreneurship and new business formation, financial management, risk management, inventory control, purchasing, marketing strategies, and government regulation.

104:140 Principles of Outdoor Recreation 3 s.h.
Administration of natural resources and public land on national, state, local, and private levels; responsibilities of the recreation profession to various phases of natural resource recreation and multiple use of public wild lands.

104:141 Camp Administration 3 s.h.

104:145 Readings in Leisure arr.

104:146 Contemporary Issues in Recreation and Leisure 3 s.h.
Survey of recreation and leisure in a modern society; human and technological values as they relate to leisure; primarily for nonmajors.

104:148 Practicum in Outdoor Recreation: Touch the Earth arr.
Outdoor adventure trips sponsored by the Division of Recreational Services; individual trip fees assessed.

104:162 Aging and Leisure 3 s.h.
First half examines the status of the well elderly in relation to issues of retirement, use of free time, and factors supporting leisure activity; second half focuses on leisure services in long-term care.

104:165 Health Promotion and Wellness for Older Adults 3 s.h.
Problems of older adults; strategic efforts directed toward a long-term goal of health promotion, disease prevention, and slowing the decline of chronic conditions to allow individuals independent and rewarding lives.

104:168 Computer Applications for Park and Recreation Management 3 s.h.
Basic skills in using the Macintosh and the University's mainframe computer, with direct applications for recreation management, administration, programming, research, and park design; several software packages used to teach basic skills in the recreation budget process, office management (word processors), database and retrieval, and resource allocation.

104:180 Independent Study arr.
Investigation of a problem related to a specific area of interest.

104:181 Problems in Honors arr.

104:197 Preinternship Seminar 1 s.h.

104:198 Internship in Recreation arr.
Practical field experience arranged to include direct leadership, program planning, and administrative procedures. Consent of instructor required.

104:199 Internship in Recreation arr.
Continuation of 104:198.

Primarily for Graduates

104:201 Problems arr.
Consent of department head required.

104:210 Graduate Practicum arr.

104:211 Graduate Practicum arr.

104:228 Procedures in Therapeutic Recreation 3 s.h.
Prepares therapeutic recreation specialists to assess client needs, determine consequences, and direct therapeutic recreation activities that contribute to clients' maximum recreational functioning. Consent of instructor required. Prerequisite: graduate standing.

104:229 Development of Therapeutic Recreation Services 3 s.h.
Initiation, improvement, expansion of therapeutic recreation service for handicapped persons; practice in program evaluation procedures; parallel practices in related fields. Consent of instructor required. Prerequisite: graduate standing.

104:230 Seminar: Administration of Recreation 3 s.h.
Problems of administration, supervision, and programming in recreation programs.

104:231 Philosophy and Trends in Recreation 3 s.h.
Historical and philosophical development of attitudes toward leisure and recreation, emerging program patterns, current issues, and education for leisure living.

104:260 Theory and Methods in Social Psychology of Leisure Behavior 3 s.h.

104:310 Recreation: College Teaching Internship arr.

104:401 Seminar: Thesis I arr.

104:402 Seminar: Thesis II arr.

PHYSICAL EDUCATION, TEACHER PREPARATION PROGRAM

Coordinators: David K. Leslie, Jeannette L. Scahill
Professors: Gene M. Asprey, Donald R. Casady, James G. Hay, Barbara D. Lockhart
Associate professors: Susan J. Birrell, N. Peggy Burke, Gary F. Hansen, David K. Leslie, Kenneth E. Mobily, Jeannette L. Scahill
Assistant professors: Thomas W. Balon, Kelly J. Cole, Deidre Connelly, Warren G. Darling
Assistants in instruction: D. Duane Banks, L. Gayle Blevins, Katherine M. Carlson, Gary Close, Charles F. Darley, Diane L. DeMarco, Danny T. Foster, Carol E. Girdler, Jerald M. Hassard, Kathleen Janz, Mark A. Johnson, Robert J. Loll, Paul T. Longo, Ruth Nelson, Glenn S. Patton, Donna R. Stone, Diane M. Thomason, Theodore S. Wheeler
Undergraduate degrees offered: B.A., B.S. in Physical Education

The teacher preparation programs include those that prepare students to teach physical education, to coach athletics, and to teach health in elementary and secondary schools.

Physical Education

B.A. or B.S. with Teacher Certification

The following academic, activity, and teacher certification courses are required.

Academic

138:19 Introduction to Physical Education 1 s.h.
138:21 Theory and Principles of Fitness 1 s.h.
138:26 Laboratory in Teaching of Physical Activities 1 s.h.
138:27 Teaching of Dance 2 s.h.

138:37 First Aid and CPR 2 s.h.
or
Red Cross or comparable certification in first aid and CPR

138:53 Human Anatomy 3 s.h.
138:71 Human Growth and Motor Development 2 s.h.
138:83 Psycho-Social Dimensions of Physical Activity 3 s.h.
138:103 Administration of Physical Education and Athletics 2-3 s.h.
138:105 Physical Education for the Handicapped 3 s.h.
138:108 Motor Learning and Motor Control 3 s.h.
138:142 Contemporary Issues of Health Education 3 s.h.
138:164 History of Sport in the United States 2-3 s.h.
138:167 Measurement and Evaluation in Physical Education 3 s.h.

28:81 Kinesiology 3 s.h.
or
27:107 Biomechanics of Physical Education 3 s.h.

28:106 Physiology of Exercise 3 s.h.
or
27:140 Exercise Physiology for Practitioners 3 s.h.

Activity

Students must demonstrate competence in each of the following courses and may earn a maximum of 10 semester hours in the following activities. Students may take exemption tests for the courses marked by asterisks and may test out of a maximum of 7 semester hours.

*138:40 Tennis 1 s.h.
*138:41 Golf 1 s.h.
*138:43 Volleyball 1 s.h.
*138:49 Field Sports (flag football, soccer, speedball) 1 s.h.
*138:50 Softball 1 s.h.
*138:52 Basketball 1 s.h.
138:55 Basic Dance Skills 2 s.h.
*138:56 Track and Field 1 s.h.
*138:66 Swimming Clinic 1 s.h.
*138:67 Tumbling and Apparatus 1 s.h.
*138:68 Weight Training: Prescription and Programming 1 s.h.
138:69 Combatives, New Games and Team Handball 1 s.h.
138:70 Recreational Skills (archery, badminton, bowling, racquetball, table tennis) 1 s.h.

Teacher Certification

7E:71 Human Growth and Motor Development 2 s.h.
7S:97 Instructional Strategies and Design in Physical Education 3 s.h.
7E:72 Methods and Materials in Elementary Physical Education: Practicum Elementary School 3 s.h.
7P:75 Educational Psychology and Measurement 3 s.h.
7W:92 Introduction to Microcomputing for Teachers 1 s.h.
7F:180 Human Relations for the Classroom Teacher 3 s.h.
7S:100 Issues in Education 2 s.h.
7S:146 Methods of Secondary Physical Education 3 s.h.
7S:187 Seminar: Curriculum and Student Teaching 1 s.h.
7S:191 Observation and Laboratory Practice in the Secondary School 6 s.h.
7E:192 Special Area Student Teaching 6 s.h.

Coaching Endorsement

The Iowa Department of Education requires that athletic coaches be certified. The following program has been approved by the Iowa Department of Education and is available to students who also complete the requirements for a teaching major.

One of these is recommended:

138:33 Coaching of Football 2 s.h.
138:34 Coaching of Baseball 2 s.h.
138:35 Coaching of Track and Field Athletics 2 s.h.
138:36 Coaching of Basketball 2 s.h.
138:38 Coaching of Competitive Swimming 2 s.h.
138:39 Coaching of Wrestling 2 s.h.

All of these are required:

138:14 Theory of Coaching 2 s.h.
138:53 Human Anatomy 3 s.h.
138:71 Human Growth and Motor Development 2 s.h.
138:103 Administration of Physical Education and Athletics 2-3 s.h.
27:57 Basic Athletic Training 3 s.h.

138:37 First Aid and CPR 2 s.h.
or
Red Cross or comparable certification in first aid and CPR

28:106 Physiology of Exercise 3 s.h.
or
27:140 Exercise Physiology for Practitioners 3 s.h.

7S:198 Coaching Practicum 1-3 s.h.

Health Endorsement

The following program has been approved by the Iowa Department of Education for certification to teach health. The following courses are required.

17:41 Introductory Nutrition 3 s.h.
138:53 Human Anatomy 3 s.h.
138:71 Human Growth and Motor Development 2 s.h.
138:142 Contemporary Issues of Health Education 3 s.h.

138:37 First Aid and CPR 2 s.h.
or
Red Cross or comparable certification in first aid and CPR

7C:112 Human Sexuality 3 s.h.
or
17:122 Materials and Methods in Family Life Education 3 s.h.

71:120 Drugs: Their Nature, Action, and Use 2 s.h.
or
46:56 Non-Prescription Drugs 2 s.h.

27:140 Exercise Physiology for Practitioners 3 s.h.
or
28:106 Physiology of Exercise 3 s.h.

31:163 Abnormal Psychology 3 s.h.
or
32:193 Suffering, Death, and Faith 2 s.h.

7S:158 Methods and Administration of School Health Programs 3 s.h.

Courses

138:14 Theory of Coaching **2 s.h.**
Value and nature of athletics: structuring the program, recruitment of players, organization of personnel, scheduling of events.

138:19 Introduction to Physical Education **1 s.h.**
The profession of physical education and related disciplines; job alternatives and opportunities; guest speakers. Same as 28:19.

138:21 Theory and Principles of Fitness **1 s.h.**
Theories and principles of prescription and programming in the fitness areas of aerobics, relaxation, flexibility, and fitness testing.

138:26 Laboratory in Teaching of Physical Activities **1-2 s.h.**
Practical application of theory and concepts in teaching sports; work with instructors in skill classes. Prerequisites: 7E:71 and 7E:72, or 7S:146.

138:27 Teaching of Dance **2 s.h.**
Methods for teaching ballroom, folk, and square dance; observation of classes in progress, lesson planning, evaluative procedures, materials, teaching aids; teaching elementary, secondary, and college classes. Prerequisite: 138:55.

138:33 Coaching of Football **2 s.h.**

138:34 Coaching of Baseball **2 s.h.**

138:35 Coaching of Track and Field Athletics **2 s.h.**

138:36 Coaching of Basketball **2 s.h.**

138:37 First Aid and CPR **2 s.h.**
Leads to certification for American Red Cross First Aid and Emergency Care certificate. Same as 27:56, 28:37.

138:38 Coaching of Competitive Swimming **2 s.h.**

138:39 Coaching of Wrestling **2 s.h.**

138:40 Tennis **1 s.h.**
Same as 28:40.

138:41 Golf **1 s.h.**
Same as 28:41.

138:43 Volleyball **1 s.h.**
Same as 28:43.

138:49 Field Sports **1 s.h.**

138:50 Softball **1 s.h.**
Same as 28:50.

138:52 Basketball **1 s.h.**
Same as 28:52.

138:53 Human Anatomy **3 s.h.**
Tissues, organs, and systems most involved with motor activity; secondary topics include integumentary, lymphatic, urinary, digestive, and endocrine systems. Same as 27:53, 28:80.

138:55 Basic Dance Skills **2 s.h.**
Beginning- to intermediate-level western square dance and international folk dance; background and cultural information.

138:56 Track and Field **1 s.h.**

138:66 Swimming Clinic **1 s.h.**
Stroke analysis and correction, individualized instruction in preparation for advanced-level swimming classes. Same as 28:66.

138:67 Tumbling and Apparatus **1 s.h.**

138:68 Weight Training: Prescription and Programming **1 s.h.**
Program design, performance techniques, workout prescription, administrative variables in teaching weight training in the public schools.

138:69 Combatives, New Games and Team Handball **1 s.h.**

138:70 Recreational Skills **1 s.h.**
Content selection, progression; class organization and management and teaching techniques for selected activities taught in secondary schools; archery, badminton, bowling, racquetball, table tennis.

138:71 Human Growth and Motor Development **2 s.h.**
Theoretical basis for elementary physical education, including growth and development of human nervous and musculoskeletal systems; motor development from birth through puberty; motor development topics include locomotion, reaching and grasping, visuomotor coordination, development of basic skills. Same as 7E:71.

138:83 Psycho-Social Dimensions of Physical Activity **3 s.h.**
Overview of psychological and sociological aspects of sport and physical activity. Same as 28:83.

138:103 Administration of Physical Education and Athletics **2-3 s.h.**
Administrative issues: theory, budgeting practices, legal liability, public relations, evaluation of personnel. Same as 7E:103, 7S:103.

138:105 Physical Education for the Handicapped **3 s.h.**
Orthopaedic impairments, blindness, deafness, mental retardation; information for modifying activities and programming; observations in public schools: some practicum experience may be included. Prerequisite: 138:53. Same as 27:105.

138:108 Motor Learning and Motor Control **3 s.h.**
Theories of skill acquisition applied to teaching and coaching; principles of motor control, including organization of the motor system, control theory, motor programs, sensory contributions, posture, locomotion, selected voluntary movements.

138:121 History and Philosophy of Physical Education **2 s.h.**
Same as 28:121.

138:142 Contemporary Issues of Health Education **3 s.h.**
Principles and practices of healthful living; nutrition, cardiovascular health, sexuality, communicable diseases, trends in current national health policies.

138:164 History of Sport in the United States **2-3 s.h.**
Growth and institutionalization of sport from colonial times to present. Same as 28:164.

138:167 Measurement and Evaluation in Physical Education **3 s.h.**
Examination and application of a variety of measurement techniques and tests; emphasis on gaining experience in the use of different measures of psychomotor skills, including fitness and sports test batteries. Same as 27:167.

PHYSICAL EDUCATION AND SPORTS STUDIES

Chair: Bonnie Slatton
Professor: Barbara Lockhart
Professors emeritae: Margaret G. Fox, M. Gladys Scott
Associate professors: Susan Birrell, N. Peggy Burke, Christine H.B. Grant, Jeannette L. Scahill, Bonnie Slatton
Assistant professor: Deidre Connelly
Visiting lecturer: Catriona Parratt
Assistants in instruction: Beth Beglin, Gayle Blevins, Katherine M. Carlson, Charles Darley, Diane L. DeMarco, Carol Girdler, Jerald M. Hassard, Kathy Janz, Peter Kennedy, Ruth Nelson, Micki Schillig, Donna Stone, Vivian Stringer, Diane M. Thomason
Undergraduate degrees offered: B.A., B.S. in Physical Education
Graduate degrees offered: M.A., Ph.D. in Physical Education

The Department of Physical Education and Sports Studies offers bachelor's degree programs with a major in physical education and specializations in fitness/wellness and sport management. It also offers graduate programs leading to the Master of Arts and Doctor of Philosophy degrees in physical education.

Undergraduate Programs

Each undergraduate student in physical education elects a wide variety of courses and activities in preparation for careers in corporate fitness programs, wellness centers, private health clubs, YM-YWCAs, and sport programs.

Students acquire theoretical background through anatomy, kinesiology, physiology, and health courses, with implications for the performance and teaching of fitness and sport skills.

The undergraduate programs are also designed to prepare students for graduate work in physical education. (See "Graduate Programs" for areas of specialization.)

The professional major in physical education may lead to either the Bachelor of Arts or Bachelor of Science degree.

Physical Education Program (Nonteaching)

Core Requirements

28:19 Introduction to Physical Education 1 s.h.
28:37 First Aid and CPR 2 s.h.
28:69 Theory and Principles of Weight Training 3 s.h.
28:81 Kinesiology 3 s.h.

28:83 Psycho-Social Dimensions of Physical Activity 3 s.h.
or
28:164 History of Sport in the United States 3 s.h.

28:99 Internships (optional) 6-12 s.h.
28:106 Physiology of Exercise 3 s.h.
28:111 Methods and Materials for Sport/Wellness Promotion 3 s.h.
28:113 Stress Management 2 s.h.
28:132 Administration of Sport/Wellness Programs 3 s.h.

Activity Requirements

All students specializing in fitness/wellness or sport management complete one team sport, one dance activity, one racquet sport, one aquatic activity, one fitness activity, one individual activity, and two additional activities of their choice. Any or all of these requirements may be satisfied by passing skill and knowledge tests for the sport or activity.

Fitness/Wellness

28:53 Rhythmic Design for Exercise Programs 2 s.h.
138:142 Contemporary Issues of Health Education 3 s.h.
28:104 Principles of Exercise Testing and Prescription (Lab) 4 s.h.
22C:1 Survey of Computing 3 s.h.
17:41 Introductory Nutrition 3 s.h.

Sport Management

138:14 Theory of Coaching 2 s.h.
28:156 Minorities in Sport 3 s.h.
28:163 Sport and the Media 3 s.h.
22C:1 Survey of Computing 3 s.h.
19:162 Communication and Public Relations 3 s.h.
36C:35 Business and Professional Speaking 3 s.h.
7W:105 Design and Production of Media for Instruction 2 s.h.

Minor in Physical Education

The minor in physical education requires at least 15 semester hours of credit with a minimum grade-point average of 2.00. Twelve of the 15 semester hours must be taken at The University of Iowa in advanced courses. Students may choose from the following courses:

28:80 Human Anatomy 3 s.h.
28:83 Psycho-Social Dimensions of Physical Activity 3 s.h.
28:106 Physiology of Exercise 3 s.h.
28:132 Administration of Sport/Wellness Programs 3 s.h.
28:164 History of Sport in the United States 2-3 s.h.
138:142 Contemporary Issues of Health Education 3 s.h.
27:107 Biomechanics of Physical Education 3 s.h.

Honors

The honors program is designed to serve the interests of superior students. It gives participants some research experience and a perspective on some aspects of graduate work. Honors students in physical education take 28:93 Honors Readings, complete a reading or research project under supervision of a physical education faculty member, and prepare a paper summarizing project results. To be eligible for honors study in physical education, students must have at least a 3.20 grade-point average at the beginning of the junior or senior year, when the honors courses are taken. To qualify for the honors degree, students must maintain at least a 3.20 grade-point average through the remainder of their degree work.

Graduate Programs

This UI physical education department has been a pioneer in providing graduate physical education programs for women, especially at the doctoral level. It has awarded more than 400 master's degrees and more than 150 doctoral degrees during the past 50 years. Its graduates have provided distinguished service through teaching, coaching, research, administration, and other leadership roles in physical education, dance, and athletics. The department's proud heritage of producing leaders has been furthered by recent graduates, and it continues to encourage high aspirations of the young women and men it serves.

The curricula assume previous education in the respective fields. A program is planned individually with consideration given to the student's previous education and anticipated career. Completion of the graduate degree usually leads to teaching, research, coaching, or administration in a school or university.

The outstanding characteristics of the graduate programs are the flexibility of program planning for the individual student and the diversity of available research areas. Attendance at summer sessions is helpful in obtaining diverse instruction.

Graduate students work primarily in the Department of Physical Education and Sports Studies, but the resources of the Division of Physical Education and the entire University are available as needed. Work outside the department provides a broad view and enrichment for selected specializations of master's and doctoral candidates.

Internships are available in many areas and are strongly encouraged for students specializing in administration and coaching.

The graduate student group is cosmopolitan and international.

Master of Arts

The M.A. degree is awarded on completion of at least 30 semester hours of graduate work including thesis, or 35 semester hours of course work without thesis. The curriculum leads to teaching, administration, coaching certification, or preparation for advanced degree work.

Core Requirements

Students must demonstrate competence in physiology of exercise amd kinesiology. Competence may be demonstrated by completion of a course at the undergraduate or graduate level or satisfactory performance on a written examination.

The following courses are required.
28:205 Techniques of Research 3 s.h.
28:302 Seminar: Perspectives in Human Movement 2 s.h.
28:401 Thesis (for students on thesis option) arr.
A statistics course 3 s.h.

The sport studies core consists of four areas: philosophy of sport, psychology of sport, sociology of sport, and history of sport. Students are required to take one course from at least three of these areas. Students in the fitness/wellness program may choose to select courses from only two areas. The following courses satisfy the sport studies core requirements.
28:247 Philosophy of Sport
28:267 Social Psychology and Sport

28:248 Sociology of Sports
or
28:153 Sociology of Women in Sport
or
28:156 Minorities in Sport

28:164 History of Sport in the United States
or
28:174 Sport in Western Civilization, Greeks to Present

Program Options

M.A. students may elect a general sport studies curriculum or a specialization in administration of athletics or physical education, administration of fitness/wellness programs, coaching, education, psychology of sport or sociology of sport. Students interested in other specializations may submit a course of study to the graduate committee for consideration.

In addition to the required courses listed above, students must take the core courses in their area of specialization as indicated below and electives selected in consultation with the adviser.

Administration of Physical Education and Athletics

28:108 Principles of Administration 3 s.h.
28:203 Current Issues 2 s.h.

28:350 Advanced Athletic Administration 3 s.h.
or
28:319 Administration in Physical Education 3 s.h.

Administration of Fitness/Wellness Programs

28:104 Principles of Exercise Testing and Prescription	4 s.h.
28:113 Stress Management	2 s.h.
28:132 Administration of Sport/Wellness Programs	3 s.h.
28:165 Internships	2-3 s.h.
28:216 Physiological Responses to Exercise and Training	3 s.h.
17:142 Nutrition	3 s.h.
7S:131 Introduction to Computer Programming for Teachers	2-3 s.h.
7W:105 Design and Production of Media for Instruction (Graphic Design and Video)	2 s.h.

Coaching

All students must have or earn a coaching endorsement.

28:102 Physiological Research on Women in Sport	2-3 s.h.
28:165 Internships	1-2 s.h.
28:203 Current Issues	2 s.h.
28:218 Advanced Coaching	2 s.h.

Sociology of Sport

28:153 Sociology of Women in Sport
28:156 Minorities in Sport
28:163 Sport and the Media
28:340 Seminar in Sociology of Sport
28:348 A Cultural Analysis of Sport

Sport Psychology

28:113 Stress Management	2 s.h.
28:330 Seminar in Sport Psychology	3 s.h.
or	
28:331 Selected Issues in Social Psychology and Physical Activity	3 s.h.
Psychology Electives	6 s.h.

Sport Studies

Students in the general sport studies program must take at least one course from each of the four core areas. In addition, students must take at least two courses in the following areas:

Administration of athletics, or physical education, or fitness/wellness
Coaching
History of sport
Philosophy of sport
Physiology
Sociology of sport
Sport psychology

Doctor of Philosophy

All doctoral students must complete a minimum of 72 semester hours of graduate work, including general requirements for the master's degree and credit for the dissertation.

Prerequisites

Competence in the areas noted under the M.A. program also is required for doctoral programs. Deficiencies in these areas must be remedied as early as possible.

Research Tools

All doctoral students are required to take a statistics course at an appropriate level at The University of Iowa. Students may choose either a foreign language or computer science as their second research tool.

The language requirement may be satisfied by taking two semesters of a given language with a minimum grade of C, by passing a Graduate Record Examination (GRE) General Test in a given language, or by passing a Ph.D. language examination.

The computer tool requirement option may be satisfied by taking 3 semester hours as approved by the departmental graduate committee.

Required Courses

28:300 Research Forum	0 s.h.
28:302 Seminar: Perspectives in Human Movement	2 s.h.
28:401 Thesis	arr.

Specialization

Students must complete a specialization of 30 semester hours, including dissertation; they also must take approximately 20 semester hours in one or more departments other than the Department of Physical Education and Sports Studies. The following specialization areas have been approved: administration of physical education and athletics, psychology of sport, and sociology of sport. Students interested in another area may submit a plan of study for consideration.

Comprehensive Examination

All doctoral students must pass a comprehensive examination focused on, but not necessarily limited to, their area of specialization. Part of the examination may be oral. The examination is conducted according to the policies established by the departmental graduate committee and is taken on a date set by the student and his or her adviser. The program of study and dissertation topic must be filed and the tool requirements met before the student can take the comprehensive examination.

Dissertation

All doctoral students are required to complete a dissertation. A final examination is held with an appropriate committee.

Residency Requirement

Doctoral students must complete two semesters of at least 9 semester hours each in residence at The University of Iowa.

Faculty

Faculty members represent diversified backgrounds and specializations; their abilities and interests are complementary. All hold advanced degrees, several bring educational backgrounds from abroad, and all are experienced teachers. Graduate faculty members have experience in research and writing and are available to guide graduate students in their areas of specialization. Many hold significant leadership positions and are frequently called upon for lectures, speeches, and research presentations.

Facilities

Gymnasiums, dance studios, special exercise rooms, and pools are used in the various programs in Halsey Hall, North Hall, the Field House, and the Recreation Building. A variety of fields for outdoor sports are available on campus. The proximity of the Iowa River makes canoeing instruction feasible in a regular class schedule. The archery range is located along the river in a rustic setting; outdoor fields and a track are available. The University golf course is used for some classes.

A research laboratory equipped for psychosocial, measurement, and motor learning research is available in the department, and laboratories dealing with virtually all aspects of physical education are available within the division. The division also houses computer terminals, and students may use facilities of the University's Weeg Computing Center for research. A physical education library is located in the Field House.

Courses

Physical Education and Sports Studies—Primarily for Undergraduates

28:000 Cooperative Education Internship 0 s.h.

28:1 Skill Acquisition in Physical Education 1 s.h.
May be repeated.

28:2 Skill Acquisition in Physical Education 1 s.h.

28:17 Advanced Life Saving 1 s.h.

28:18 Water Safety Instructor 1 s.h.
Leads to Red Cross Senior Water Safety Certificate or Instructor's Certificate. Consent of instructor required.

28:19 Introduction to Physical Education 1 s.h.
Study of the profession of physical education and related disciplines; seminar approach with guest speakers; job alternatives and opportunities discussed. Same as 138:19.

28:31 Officiating 1 s.h.
Officiating techniques for selected sports.

28:32 Officiating 1 s.h.
May follow 28:31 or be taken as independent unit.

28:37 First Aid and CPR 2 s.h.
Leads to certification for American Red Cross Advanced First Aid and Emergency Care Certificate. Same as 27:56, 138:37.

28:40 Tennis 1 s.h.
Same as 138:40.

28:41 Golf 1 s.h.
Same as 138:41.

28:43 Volleyball 1 s.h.
Same as 138:43.

28:50 Softball 1 s.h.
Same as 138:50.

28:52 Basketball 1 s.h.
Same as 138:52.

28:53 Rhythmic Design for Exercise Programs 2 s.h.
Practical experience in developing exercise routines with music; selection and analysis of music, critical examination of exercise techniques, learning a variety of dance steps, and methods of combining dance steps/exercise with music to formulate routines.

28:60 Tennis II 1 s.h.

28:62 Basketball II 1 s.h.
For students with previous experience and/or instruction in basketball.

28:63 Volleyball II 1 s.h.
For students with previous experience and/or instruction in volleyball.

28:66 Swimming Clinic 1 s.h.
Stroke analysis and correction; individualized instruction to prepare students for advanced-level swimming classes. Same as 138:66.

28:69 Theory and Principles of Weight Training 1 s.h.
Principles, techniques, and safety procedures of free and fixed weight training programs.

28:80 Human Anatomy 3 s.h.
Required of all students majoring in physical education; general human anatomy, emphasizing factors influencing movement. Offered fall semesters. Same as 27:53, 138:53.

28:81 Kinesiology 3 s.h.
Mechanics of human movement and analysis of motor skills. Offered spring semesters. Prerequisite: 28:80 or consent of instructor.

28:83 Psycho-Social Dimensions of Physical Activity 3 s.h.
Overview of psychological and sociological aspects of sport and physical activity. Same as 138:83.

28:91 Independent Study arr.

28:93 Honors Readings arr.

28:99 Internships arr.
Individual opportunities for supervised laboratory or field experience in a variety of sport and activity settings.

Physical Education—for Undergraduates and Graduates

28:100 Computer Uses in Physical Education 0-1 s.h.

28:101 Fitness Assessment Laboratory 2 s.h.
Experience in measurement of health-related components of physical fitness; opportunities for supervised work in physical education skills program or Student Health Service. Consent of instructor required.

28:102 Physiological Research on Women in Sport 2-3 s.h.
Physiological capabilities, responses to training, and factors specific to pregnancy, child bearing, and gender-related injuries. Same as 131:102.

28:103 Psychology of Coaching 2 s.h.
Application of psychological principles to athletic and coaching situations; topics include competition, motivation, confidence, and anxiety in athletics.

28:104 Principles of Exercise Testing and Prescription (Lab) 4 s.h.
Introduction to the health-related components of physical fitness, including assessment and exercise program design. Prerequisite: 28:106 or equivalent.

28:106 Physiology of Exercise 2-3 s.h.
Physiological effects of exercise and lack of exercise; methods of conditioning for various exercise programs.

28:108 Principles of Administration 3 s.h.
Conduct of intercollegiate athletics designed to provide educational value for the participant.

28:111 Methods and Materials for Sport/Wellness Promotion 3 s.h.
Methods, materials, and graphic design techniques for sport/wellness presentations to adult populations. Prerequisite: major in physical education or consent of instructor.

28:112 Workshop Sport Studies 1-4 s.h.

28:113 Stress Management 2 s.h.
Stress and the stress response; causes and consequences of stress; stress management procedures.

28:114 Mental Training for Peak Performance 2-3 s.h.
Same as 27:106.

28:117 Ancient Athletics 2-3 s.h.
Same as 27:104, 14:104.

28:121 History and Philosophy of Physical Education 2 s.h.
History of physical education and sport from primitive civilizations through America in the twentieth century. Offered spring semesters. Same as 138:121.

28:125 Foundations of Coaching 2 s.h.
Philosophic bases of coaching; theoretical and practical applications.

28:132 Administration of Sport/Wellness Programs 2-3 s.h.
Program planning, legal liability, public relations techniques, and financial management of sport/wellness programs in private, corporate, hospital, and agency settings. Prerequisite: 28:104 or consent of instructor.

28:146 Methods and Administration of School Health Programs 3 s.h.
Administration of health education programs, teaching methodologies, materials development, and health concepts. Prerequisite: 138:142. Same as 7S:158.

28:147 Practicum in Health Education 0-3 s.h.
Training and experience in planning and implementing programs on health-related topics: nutrition, physical fitness, substance abuse, sexuality. Consent of instructor required. Prerequisite: 28:146 or equivalent.

28:152 Women as Leaders 0-2 s.h.
Leadership styles, roles, accomplishments. May be repeated.

28:153 Sociology of Women in Sport 2-3 s.h.
Feminist analysis of girls' and women's sport experiences, including the reproduction of gender through sport, recent changes in women's intercollegiate athletics, media representations of women in sport, and feminist critiques and alternatives to sport. Same as 131:153.

28:156 Minorities in Sport 3 s.h.
Sport experiences and barriers to participation based on sexism, racism, classism, ageism, and heterosexism.

28:163 Sport and the Media 2-3 s.h.
Representations of sport in the media, including television, the press, fiction, films, biographies, and adolescent fiction.

28:164 History of Sport in the United States 2-3 s.h.
Historical analysis of the growth and institutionalization of sport from colonial times to present. Same as 138:164.

28:165 Internships arr.
Individual opportunities to work with athletic teams; administrators; sports editors at newspapers, magazines, radio, and television; and sports information directors.

28:174 Sport in Western Civilization, Greeks to Present 3 s.h.
Development of western sport; relation to social, political, economic, and intellectual factors.

Physical Education—Primarily for Graduates

28:201 Problems arr.
Consent of instructor required.

28:203 Current Issues 2,4 s.h.
Definition and analysis of issue identification and resolution; traditional and contemporary issues in physical education, and athletics.

28:205 Techniques of Research 3 s.h.
Introduction to design and interpretation of research.

28:216 Physiological Responses to Exercise and Training 3 s.h.
Effects of exercise and training on neuromuscular, respiratory, and circulatory functioning, and energy systems.

28:218 Advanced Coaching 2 s.h.
Reading and discussion on coaching and officiating procedures in light of research and recent developments in sports.

28:247 Philosophy of Sport 3 s.h.
Exploration of the meaning of sport as a human experience; ethical and aesthetic dimensions of sport.

28:248 Sociology of Sports 2-3 s.h.
Sport as a cultural form; its relationship to ideology and practices in economics, politics, education, the family, and the media.

28:253 The Law and Sport 2 s.h.
Introduction to legal theories and statutory regulations applicable to physical education and athletics; emphasis on how to work with an attorney.

28:254 History of Women in Sports 2-3 s.h.
Exploration of women's sport involvement from ancient times to present; focus on social class, attitudes, religion, race, ethnicity, medical opinion, economic considerations, political events, and educational philosophies that have influenced women's sport participation. Same as 131:254.

28:267 Social Psychology and Sport 3 s.h.
Overview of social/psychological aspects of motor behavior; includes personality, motivation, and social influence processes in sport and physical activity.

28:299 Independent Research arr.

28:300 Research Forum 0 s.h.
Discussion of research issues and current research projects of faculty and graduate students in physical education and sports studies.

28:302 Seminar: Perspectives in Human Movement 2 s.h.
An overview of physical education.

28:319 Administration in Physical Education 3 s.h.
Leadership, management, governance, budget, personnel, planning, public relations, and facilities; theory, research, and practice; administration of physical education in schools—elementary, secondary, and college—as well as various other agencies.

28:330 Seminar in Sport Psychology 3 s.h.
Current theory and research in sport psychology, including applied sport psychology techniques. Prerequisite: 28:267.

28:331 Selected Issues in Social Psychology and Physical Activity 3 s.h.
Current issues and research related to social/psychological aspects of sport. Prerequisite: 28:267.

28:340 Seminar in Sociology of Sport 3 s.h.
Theory in sociology of sport; classical social theorists and theoretical perspectives. Prerequisite: 28:248 or consent of instructor.

28:348 A Cultural Analysis of Sport 3 s.h.
Analytical strategies for studying sport, including quantitative and qualitative techniques and materialist, feminist, and cultural studies approaches. Prerequisite: 28:248 or consent of instructor.

28:350 Advanced Athletic Administration 3 s.h.
Comprehensive analysis of the organization and administration of a Division I intercollegiate athletics program; detailed study of current issues and problems. Prerequisite: 28:108.

28:401 Thesis arr.
Consent of instructor required.

PHYSICS AND ASTRONOMY

Chair: Dwight R. Nicholson
Professors: Richard R. Carlson, Raymon T. Carpenter, Nicola D'Angelo, John D. Fix, Louis A. Frank, Christoph K. Goertz, Donald A. Gurnett, William H. Klink, Georg Knorr, Karl E. Lonngren, Edward R. McCliment, Robert L. Mutel, John S. Neff, Dwight R. Nicholson, Edwin Norbeck, Gerald L. Payne, William R. Savage, John W. Schweitzer, Arthur L. Smirl, Steven R. Spangler, William C. Stwalley
Professors emeriti: Edward B. Nelson, James A. Van Allen
Associate professors: Paul D. Kleiber, Usha Mallik, Robert L. Merlino, Charles R. Newsom, Yasar Onel, Wayne N. Polyzou, Robert A. Smith
Assistant professors: John A. Goree, Yannick Meurice, Lawrence A. Molnar, Mary H. Reno, Vincent G.J. Rodgers
Undergraduate degrees offered: B.A., B.S. in Physics, Astronomy
Graduate degrees offered: M.S. in Astronomy, Physics; Ph.D. in Physics (including specialization in Astronomy)

The Department of Physics and Astronomy provides comprehensive and rigorous instruction in all basic aspects of its subjects. It also provides research facilities and guidance for individual scholarly work at an advanced level in selected specialties.

Total departmental enrollment typically is 3,000 each semester of the academic year and 200 during the summer session. All courses and advanced laboratories are taught by full-time faculty members. Faculty members also teach elementary courses and supervise associated laboratories taught by graduate students.

Beyond the elementary level, typical course enrollment is 20; there is ample opportunity for individual work. Special introductory courses are offered for majors in physics and astronomy and for others with special interest in these subjects. There are about 100 undergraduate majors—25 of whom are honors students—and 80 graduate students in physics or astronomy.

About 50 percent of graduates with bachelor's degrees pursue advanced study. Others find positions in secondary school teaching and in government and industrial laboratories. Some use their training as the basis for careers in other fields.

Graduates with M.S. or Ph.D. degrees in physics or astronomy have many opportunities for employment in universities, colleges, and research laboratories in government and industry.

Undergraduate Programs

The department offers the following programs in physics: Bachelor of Science and Bachelor of Arts degrees and an undergraduate minor. It offers the same programs in astronomy. In addition, a double major in physics and astronomy is offered. Each program is described below.

Bachelor of Science in Physics

The B.S. program provides preparation for graduate study in physics and related sciences, or for employment in research laboratories.

Required Courses

The following courses or their equivalents are required for the Bachelor of Science degree with a major in physics. Students must select Group 1 or Group 2.

Group 1

22M:25-26 Calculus I-II	8 s.h.
or	
22M:45-46 Accelerated Calculus I-II	8 s.h.
22M:27 Introduction to Linear Algebra	4 s.h.
22M:28 Calculus III	4 s.h.

Group 2

22M:35-36 Engineering Calculus I-II	8 s.h.
or	
22M:45-46 Accelerated Calculus I-II	8 s.h.
22M:40 Matrix Algebra for Engineers	2 s.h.
22M:41 Differential Equations for Engineers	3 s.h.
22M:42 Vector Calculus for Engineers	3 s.h.

Other Required Courses

Students also must take the following:

29:17-19 Introductory Physics I-III	12 s.h.
29:115 Intermediate Mechanics	3 s.h.
29:116 Introductory Quantum Mechanics	3 s.h.
29:118 Statistical Physics	3 s.h.
29:129-130 Electricity and Magnetism	6 s.h.
29:132 Intermediate Laboratory (two semesters)	4 s.h.

Two additional courses, one of them at the 190 level, selected from:

29:117 Optics	3 s.h.
29:128 Electronics	4 s.h.
29:132 Intermediate Laboratory (third semester)	2 s.h.
29:171 Mathematical Methods of Physics	3 s.h.
29:191 Atomic Physics	3 s.h.
29:192 Elementary Particles and Nuclear Physics	3 s.h.
29:193 Introductory Solid State Physics	3 s.h.
29:194 Plasma Physics	3 s.h.

An additional 5 semester hours of introductory course work in another science or engineering field, including computer science but not mathematics

Undergraduate majors who plan to pursue graduate study are advised to go as far beyond the minimum requirements stated above as feasible including further work in mathematics. However, only 50 semester hours of 29-prefix courses count toward a single-major bachelor's degree.

Bachelor of Arts in Physics

The B.A. program is designed for students who wish to gain considerable knowledge of physics but do not plan a research-oriented career in physics. This degree program is appropriate for those planning careers in medicine, law, science-related administration, business, technical writing, or secondary-school science teaching (see "Science Education" in this section of the *Catalog* and in the College of Education section). The B.A. program requires fewer courses in physics and mathematics than the B.S. program, and thus provides for a wider choice of electives.

The following courses or their equivalents are required for the Bachelor of Arts degree with a major in physics.

22M:25-26 Calculus I-II	8 s.h.
or	
22M:35-36 Engineering Calculus I-II	8 s.h.
29:17-18 Introductory Physics I-II	8 s.h.
or	
29:11-12 College Physics	8 s.h.
29:19 Introductory Physics III	4 s.h.
29:115 Intermediate Mechanics	3 s.h.
29:118 Statistical Physics	3 s.h.
29:128 Electronics	4 s.h.
or	
29:129 Electricity and Magnetism	3 s.h.
29:132 Intermediate Laboratory (two semesters)	4 s.h.

An additional 12 semester hours or more of science in a thematic area as approved by the student's adviser or the course work required for teacher certification

Minor in Physics

A program of physics courses satisfying the 15 semester hours, with a minimum grade-point average of 2.00, required for a minor by the College of Liberal Arts must include 12 semester hours of upper-level physics courses taken at The University of Iowa, including 29:19 (prerequisites:29:17 and 29:18) and all 100-level physics courses.

Bachelor of Science in Astronomy

A balanced and integrated program of astronomy, mathematics, and physics courses is required for the B.S. degree in astronomy. This program prepares students for careers or advanced study in astrophysics, radio astronomy, or space astronomy.

The following courses or their equivalents are required for the Bachelor of Science degree with a major in astronomy. Students must select Group 1 or Group 2.

Required Courses

Group 1

22M:25-26 Calculus I-II	8 s.h.
or	
22M:45-46 Accelerated Calculus I-II	8 s.h.
22M:27 Introduction to Linear Algebra	4 s.h.
22M:28 Calculus III	4 s.h.

Group 2

22M:35-36 Engineering Calculus I-II	8 s.h.
or	
22M:45-46 Accelerated Calculus I-II	8 s.h.
22M:40 Matrix Algebra for Engineers	2 s.h.
22M:41 Differential Equations for Engineers	3 s.h.
22M:42 Vector Calculus for Engineers	3 s.h.

Other Required Courses

Students also must take the following:

29:17-19 Introductory Physics I-III	12 s.h.
29:61-62 General Astronomy	8 s.h.
29:115 Intermediate Mechanics	3 s.h.
29:116 Introductory Quantum Mechanics	3 s.h.
29:119-120 Introduction to Astrophysics I-II	6 s.h.

29:129-130 Electricity and Magnetism	6 s.h.
29:132 Intermediate Laboratory	2 s.h.
29:137 Astronomical Laboratory	2 s.h.
29:191 Atomic Physics	3 s.h.
or	
29:194 Plasma Physics	3 s.h.

Undergraduate majors who plan to pursue graduate study are advised to go as far beyond the minimum requirements listed above as feasible, by taking one or more of the courses listed below. However, only 50 semester hours of 29-prefix courses can count toward a single-major bachelor's degree.

29:117 Optics	3 s.h.
29:118 Statistical Physics	3 s.h.
29:121 Introduction to Astrophysics III	3 s.h.
29:137 Astronomical Laboratory (additional semester)	2 s.h.
29:171-172 Mathematical Methods of Physics	6 s.h.
29:195 Plasma Physics	3 s.h.

Bachelor of Arts in Astronomy

The B.A. degree program is designed for students who wish to gain considerable knowledge of astronomy but who do not plan a research-oriented career in astronomy. This degree program is appropriate for those planning careers in secondary-school science teaching, technical writing, and science-related administration (see "Science Education" in this section of the *Catalog* and in the College of Education section). The B.A. program requires fewer courses in physics and mathematics than the B.S. program, and thus provides for a wider choice of electives.

The following courses or their equivalents are required for the B.A. degree with a major in astronomy.

22M:25-26 Calculus I-II	8 s.h.
or	
22M:35-36 Engineering Calculus I-II	8 s.h.
29:17-18 Introductory Physics I-II	8 s.h.
or	
29:11-12 College Physics	8 s.h.
and	
29:19 Introductory Physics III	4 s.h.
29:61-62 General Astronomy	8 s.h.
29:115 Intermediate Mechanics	3 s.h.
29:117 Optics	3 s.h.
or	
29:118 Statistical Physics	3 s.h.
29:119-120 Introduction to Astrophysics I-II	6 s.h.
29:128 Electronics	4 s.h.
or	
29:129 Electricity and Magnetism	3 s.h.
29:132 Intermediate Laboratory	2 s.h.
29:137 Astronomical Laboratory	2 s.h.

Minor in Astronomy

A minor in astronomy requires 15 semester hours of credit in astronomy courses with a minimum grade-point average of 2.00. The 15 semester hours should include 6 semester hours selected from the following:

29:119-121 Introduction to Astrophysics I-III
29:137 Astronomical Laboratory
An additional 6 semester hours of these courses or of 100-level physics courses

These 12 semester hours must be taken at The University of Iowa.

Double Major in Physics and Astronomy

Students who wish to obtain a double major in physics and astronomy must earn a minimum of 56 semester hours outside physics and astronomy. Those interested in such a combination should consult with their adviser. For general requirements of the College of Liberal Arts, see the "College of Liberal Arts" section of the *Catalog*.

Honors

Junior and senior majors who are members of the College of Liberal Arts Honors Program may take 6-8 semester hours of 29:99 Honors Seminar and conduct an investigation with the guidance of a faculty member as part of their programs for the B.A. or B.S. with honors in physics or astronomy. They must present a written research report (honors thesis) and describe the results of the research at a departmental seminar.

Graduate Programs

Two advanced degrees are offered in physics: the Master of Science—with either thesis or critical essay—and the Doctor of Philosophy. One is offered in astronomy: the Master of Science—with either thesis or critical essay. Students who wish to pursue a program in astronomy beyond the M.S. level may qualify for a Ph.D. degree in physics with specialization and a dissertation in astronomy or astrophysics. An M.S. degree is not prerequisite to the Ph.D.

The Department of Physics and Astronomy participates in an interdisciplinary doctoral program with the Program in Applied Mathematical Sciences (see the "Graduate College" section of the *Catalog*).

Each entering graduate student is assigned a faculty adviser, who assists in preparing a plan of study and in guiding the student's progress. Graduate students become candidates for advanced degrees in physics or astronomy only after passing a qualifying examination in all principal areas of physics at the level of advanced undergraduate work. The examination is given during the first week of the second semester each year and must be taken by all first-year graduate students. After a student has selected a research specialty, the appropriate thesis or essay adviser then becomes the candidate's general adviser and the chair of the final examination committee.

Master of Science in Physics

The M.S. degree in physics is offered with either thesis or critical essay. The degree may be terminal or an intermediate step toward a Ph.D. degree. In either case, the final examination is oral, conducted by a committee of three members of the graduate faculty appointed by the dean of the Graduate College.

The program for the M.S. degree with thesis requires 30 semester hours of graduate work (100- or 200-level courses) and a thesis based on an original experimental or theoretical investigation by the candidate. No more than 6 of the minimum 30 semester hours may be for research (29:281 Research: Physics).

The program for the M.S. degree with a critical essay requires 30 semester hours of graduate work (100- or 200-level courses), an independent study of the literature on a chosen topic, and preparation of a critical essay on that topic. No more than 4 of the minimum 30 semester hours may be for the critical essay (29:220 Individual Critical Study). Up to one-third of the graduate program may be in related scientific fields other than physics and mathematics—for example, chemistry, astronomy, geology, or engineering.

Candidates for either of the M.S. degree programs must have satisfactorily completed the following courses or their equivalents as undergraduates or graduates:

29:115 Intermediate Mechanics	3 s.h.
29:116 Introductory Quantum Mechanics	3 s.h.
29:118 Statistical Physics	3 s.h.
29:129-130 Electricity and Magnetism	6 s.h.
29:132 Intermediate Laboratory (two semesters)	4 s.h.
or	
29:133 Advanced Laboratory (two semesters)	4 s.h.
29:171-172 Mathematical Methods of Physics	6 s.h.
29:191 Atomic Physics	3 s.h.

Two additional courses selected from:

29:192 Elementary Particles and Nuclear Physics	3 s.h.
29:193 Introductory Solid State Physics	3 s.h.
29:194 Plasma Physics	3 s.h.

The student's plan of study should provide for as much advanced work as aptitude and previous preparation permit.

Master of Science in Astronomy

The M.S. degree in astronomy is offered with either thesis or critical essay. The general requirements are the same as those for the M.S. in physics (see above).

Course requirements or their equivalents for undergraduates or graduates are:

29:115 Intermediate Mechanics	3 s.h.
29:116 Introductory Quantum Mechanics	3 s.h.
29:117 Optics	3 s.h.
29:118 Statistical Physics	3 s.h.
29:119-121 Introduction to Astrophysics I-III	9 s.h.
29:129-130 Electricity and Magnetism	6 s.h.
29:133 Advanced Laboratory	2 s.h.
29:137 Astronomical Laboratory	2 s.h.
29:171-172 Mathematical Methods of Physics	6 s.h.
29:191 Atomic Physics	3 s.h.
29:194 Plasma Physics	3 s.h.

Students who intend to pursue a Ph.D. in physics with an astrophysics specialization should take the following courses as early in the master's program as possible.

29:195 Plasma Physics	3 s.h.
29:232-233 Theoretical Astrophysics I-II	6 s.h.
29:234 Stellar Structure and Evolution	3 s.h.
29:235 Special Topics in Astrophysics	2 s.h.
29:263 Seminar: Astrophysics	arr.

Doctor of Philosophy in Physics

The program of study for the Ph.D. degree with a major in physics includes thorough course work in both classical and quantum theoretical physics for all candidates, whether their specialized research is to be in an experimental or a theoretical area. All candidates must take comprehensive examinations; participate in advanced seminars; do original research in experimental physics, theoretical physics, or astrophysics; and prepare and defend a written dissertation based on this work.

They also must take at least 27 semester hours of 200-level courses in the department, excluding 29:220, 29:281, 29:282, and seminars. The following minimum program is recommended as preparation for the comprehensive examinations.

29:191 Atomic Physics	3 s.h.
29:192 Elementary Particles and Nuclear Physics	3 s.h.
29:193 Introductory Solid State Physics	3 s.h.
29:194 Plasma Physics	3 s.h.
29:205 Classical Mechanics	3 s.h.
29:212 Statistical Mechanics I	3 s.h.
29:213-214 Classical Electrodynamics	6 s.h.
29:245-246 Quantum Mechanics I-II	6 s.h.

Advanced mathematics, such as the theory of functions of a complex variable and vector and tensor analysis, is used freely in these courses. An introduction to these fields is given in 29:171-172 Mathematical Methods of Physics. The selection of less advanced courses will depend on the adequacy of the students' preparation for graduate work; the students' choice of more advanced and specialized courses will depend on the direction in which their interests develop. No more than 30 of the minimum 72 semester hours may be in research and seminars.

Candidates for the Ph.D. degree are not recommended for the degree until they have written the dissertation in proper form for formal publication and have submitted it for publication, with the approval of the research adviser, to a widely distributed, refereed scientific journal.

Financial Aid

Students qualified for graduate study are encouraged to apply for fellowships and assistantships. Inquiries should be directed to the departmental chair.

Research and Facilities

The department has an excellent library and a number of well-equipped laboratories and observatories. Several VAX computers are available within the department, and the associated facilities of the University's Weeg Computing Center are available for research by students and staff. Out-of-state supercomputers are accessed via telephone. The central machine shop is fully equipped and staffed with skilled instrument makers and machinists, and there are several electronics and machine shops for the use of advanced students and the research staff.

Experimental research is conducted in astronomy (optical and radio), atomic and molecular physics, elementary particle physics, laser physics, nuclear physics, plasma physics, solid state physics, and space physics. Extensive facilities are available for construction of equipment for satellites and spacecraft and for computerized decoding and analysis of data.

A versatile 6.0-MV Van de Graaff accelerator, which has been modified for energies up to 14 MeV, is used in studies of nuclear reactions induced by hydrogen, helium, lithium, and beryllium nuclei. Experiments on fundamental thermal, electrical, and magnetic properties of metals, alloys, compounds, and high-temperature superconductors are included in the experimental solid state program, as are surface studies of metals and semiconductors. Several experimental plasma devices, including a Q-machine, are used to study confinement, nonlinear waves, and turbulence effects in low-temperature, steady-state plasmas.

State-of-the-art laser systems are available for high resolution spectroscopic measurement and ultrafast pump-probe studies of molecular structure, collisional relaxation and nonlinear optical effects in atomic and molecular systems and semiconductor materials, and for plasma diagnostics.

Experimental research in elementary particle physics is carried out at Fermi National Accelerator Laboratory, Los Alamos National Laboratory, Stanford Linear Accelerator Center, CERN in Switzerland, DESY in Germany, and other international laboratories. The present generation of high-energy experiments has been designed to probe both the strong nuclear force and the weak interactions.

The department is well-equipped for research in observational astronomy. The primary optical instrument, a 24-inch reflector with a computer-controlled photometer, is used for stellar, planetary, and cometary studies. Research programs in galactic and extragalactic radioastronomy are carried out using an 18.3-meter parabolic reflector located at the North Liberty Radio Observatory near Iowa City, one of the radiotelescopes in the U.S. Very Long Baseline Interferometry network. Current long-term research activities include studies of extragalactic radio sources and OH masers. Students and faculty also conduct research programs using the Very Large Array, the National Radio Astronomy Observatory, the Kitt Peak National Observatory, the Arecibo Observatory, the Infrared Telescope Facility, the International Ultraviolet Explorer, and the Very Long Baseline Interferometry network.

Active theoretical research is carried on in astrophysics; atomic, molecular, and optical physics; elementary particle physics; mathematical physics; nuclear physics; plasma physics; solid-state physics; and space physics. Much of the numerical work for this research is performed on supercomputers located around the United States. An active mathematical physics seminar fosters the exchange of ideas between mathematics and physics.

Courses

Prerequisites and corequisites are specified as guides and may be waived by the instructor. Students may not repeat an elementary course for credit or grade points if they already have completed a higher level course for which the elementary course, or its equivalent, is a prerequisite. Courses 29:5, 29:8, 29:11-12, 29:17-18, 29:50, and 29:61-62 are accepted toward the College of Liberal Arts General Education Requirement in the natural sciences.

Physics—Primarily for Undergraduates

29:000 Cooperative Education **0 s.h.**

29:5 Chemistry and Physics of the Environment **3 s.h.**
Discussion and clarification of chemistry and physics of the ecology of our planet; air, earth, water, and noise pollution; return of pollutants to man; and chemistry and physics of the balance of nature—all relevant principles of physics and chemistry at an elementary level; for nonscience students. GER: natural sciences.

29:8 Basic Physics **3-4 s.h.**
Quantitative treatment of mechanics, electricity, heat, liquids, gases, and atomic, nuclear, and elementary

particle physics; 4 semester hour option includes a three-hour weekly discussion-laboratory. GER: natural sciences. Not open to students who have received credit for 29:11. Prerequisite: 22M:5 or equivalent.

29:11 College Physics **4 s.h.**
Lectures, laboratory, and problem work in mechanics, heat, sound, and special relativity; 29:11 and 29:12 constitute a complete introductory course in physics. GER: natural sciences. Prerequisite: 22M:5.

29:12 College Physics **4 s.h.**
Continuation of 29:11, which is prerequisite; electricity, magnetism, light, and modern physics. GER: natural sciences.

29:15 Introduction to Space Science **3 s.h.**
Space exploration knowledge is surveyed, including: the magnetospheres of the Earth, Jupiter, and Saturn; the solar wind; Jupiter and Saturn and their moons; Mars and Venus; the solar corona and chromosphere; birth and death of the solar system.

29:17 Introductory Physics I **3-4 s.h.**
Mechanics, heat, and sound. Recommended for majors in physics, astronomy, other sciences, engineering, and for honors students. GER: natural sciences. Corequisite: 22M:25 or 22M:35.

29:18 Introductory Physics II **3-4 s.h.**
Continuation of 29:17; electricity, magnetism, and light. GER: natural sciences.

29:19 Introductory Physics III **4 s.h.**
Continuation of 29:18; atomic, nuclear, and particle physics; relativity.

29:81 Intermediate Engineering Physics I **3 s.h.**

29:82 Intermediate Engineering Physics II **3 s.h.**

29:83 Modern Physics **3 s.h.**
Wave mechanics, the hydrogen atom, atomic and molecular structure, nuclear physics, and elementary particles; primarily for engineering students. Prerequisite: 29:18.

29:93 Reading in Physics **arr.**

29:98 Undergraduate Seminar **arr.**
Reading and discussion on a selected topic in physics or astronomy under guidance of an instructor. May be repeated.

29:99 Honors Seminar **arr.**
Supervised original research project leading to written report and oral defense; for junior and senior honors candidates majoring in physics or astronomy.

Physics—for Undergraduates and Graduates

29:103 Reading in Physics **arr.**

29:105 General Physics I **3 s.h.**
Classical mechanics, fundamental conservation laws, and quantitative study of motion; historical background; television and text presentation.

29:106 General Physics II **3 s.h.**
Continuation of 29:105; electricity and magnetism, relativity, thermodynamics, and quantum physics; historical background; television and text presentation.

29:112 Musical Acoustics **3 s.h.**
Acoustical foundations of music: production of sound by vibrating objects, properties of sound waves, vocal acoustics, hearing, room acoustics, principles of electroacoustics; descriptive course without specific math requirements. Same as 25:295.

29:113 Introductory Acoustics **3 s.h.**
Properties of sound waves: propagation, reflection, and absorption; physical principles of mechanical and electronic generation; recording and reproduction of sound; room acoustics; examples from model systems, musical acoustics, electroacoustics, and environmental concerns. Recommended: background in basic algebra and physics.

29:115 Intermediate Mechanics **3 s.h.**
Newtonian mechanics; noninertial reference systems; central forces and celestial mechanics; rigid body motion; Lagrangian and Hamiltonian equations of motion; small oscillations. Prerequisites: 22M:26 or 22M:36, and 29:17 or 29:11.

29:116 Introductory Quantum Mechanics **3 s.h.**
Introduction to the mathematics of quantum mechanics; state functions and their interpretations; Schrödinger equation; states of a particle in one dimension; harmonic oscillator; central potentials; angular momentum states; spin and statistics; scattering; Heisenberg equations of motion; perturbation theory. Prerequisites: 29:115, and 22M:28 or 22M:40-42.

29:117 Optics **3 s.h.**
Geometrical and physical optics; properties of lenses and simple optical instruments; phenomena of propagation, interference, diffraction, polarization of light, and modern optics; see 29:132 for laboratory work.

29:118 Statistical Physics **3 s.h.**
Integrated introduction to the subjects of thermodynamics, statistical mechanics, and kinetic theory, with emphasis on applications. Prerequisites: 29:19 and 29:115.

29:128 Electronics **4 s.h.**
Characteristics of bipolar and FET transistors and integrated circuit devices such as operational amplifiers and digital logic circuits; introduction to microprocessors; design and study of analog and digital circuits and instrumentation, with emphasis on laboratory work. Prerequisite: 29:12 or 29:18.

29:129 Electricity and Magnetism **3 s.h.**
Electrostatics, magnetic fields, and introduction to Maxwell's equations. Prerequisite: 22M:28 or 22M:40-42.

29:130 Electricity and Magnetism **3 s.h.**
Continuation of 29:129, which is prerequisite; magnetism, electromagnetic waves, A.C. circuits, and applications of Maxwell's equations to wave guides, antennas, optics, plasma physics, and other topics.

29:132 Intermediate Laboratory **2 s.h.**
Electricity; electronics; magnetism; optics; atomic, nuclear, and solid state physics; techniques in data analysis, including error analysis. Course provides laboratory work for 29:117, 29:129, 29:130, and 29:191. May be repeated.

29:133 Advanced Laboratory **2 s.h.**
Advanced topics in electricity; electronics; magnetism; atomic, nuclear, plasma, and solid state physics; techniques in data analysis, including error analysis. May be repeated.

29:171 Mathematical Methods of Physics **3 s.h.**
Functions of complex variables, integration methods, linear vector spaces, tensors, and matrix algebra. Prerequisite: 22M:28 or 22M:40-42.

29:172 Mathematical Methods of Physics **3 s.h.**
Continuation of 29:171; Hilbert space, special functions, Fourier transform and expansions in orthogonal polynomials, differential equations, and Green's functions.

29:191 Atomic Physics **3 s.h.**
Atomic and molecular structure, optical spectra and selection rules, one- and two-electron atoms, multi-electron atoms, multiplets, fine structure, Zeeman effect, hyperfine structure, molecular vibration and rotation spectra; see 29:132 for laboratory work. Prerequisite: 29:116.

29:192 Elementary Particles and Nuclear Physics **3 s.h.**
Accelerators, particle detectors, passage of radiation through matter; nuclear structure, nuclear reactions; quark model of hadrons; strong, electromagnetic, and weak interactions of elementary particles; gauge theories and intermediate vector bosons; unification of electromagnetic and weak interactions. Prerequisite: 29:116.

29:193 Introductory Solid State Physics **3 s.h.**
Phenomena associated with the solid state; classification of solids and crystal structures, electronic and vibrational processes in solids; thermal, optical, magnetic, and dielectric properties of solids; see 29:133 for laboratory work. Prerequisites: 29:116 and 22M:28, or 22M:40-42.

29:194 Plasma Physics **3 s.h.**
Physics of ionized gases, including orbit theory, guiding center motion, adiabatic invariants, and ionization balance description of plasmas by fluid variables and distribution functions; linearized wave motions and instabilities; magnetohydrodynamics. Prerequisite: 29:130.

29:195 Plasma Physics **3 s.h.**
Continuation of 29:194; linear and nonlinear solutions of the Vlasov equation, kinetic theory of plasmas including Landau damping and velocity space instabilities.

Physics—Primarily for Graduates

29:205 Classical Mechanics **3 s.h.**
Dynamics of mass points; Lagrange's and Hamilton's equations; canonical transformations and Hamilton-Jacobi theory; stochasticity and chaos. Prerequisite: 29:115.

29:211 Mechanics of Continua **3 s.h.**
Hydrostatics, dynamics of ideal fluids, both incompressible and compressible; viscous flow; classical theory of elasticity. Prerequisites: 29:205 and 29:171.

29:212 Statistical Mechanics I **3 s.h.**
Probability concepts; kinetic equations; classical and quantum equilibrium statistical mechanics with applications, including ideal and imperfect gases and phase transitions, irreversible processes, and fluctuation-dissipation theorems. Prerequisites: 29:116, 29:118, and 29:172.

29:213 Classical Electrodynamics **3 s.h.**
Advanced electromagnetostatics, boundary value problems, Green's functions, Maxwell's equations, radiation theory, physical optics, and multipole expansion of radiation field. Prerequisites: 29:130 and 29:172.

29:214 Classical Electrodynamics **3 s.h.**
Special relativity, motion of charges in fields, theories of radiation reaction, and special topics. Prerequisite: 29:213.

29:220 Individual Critical Study **arr.**
Essay on topic chosen in consultation with faculty member; for candidates for M.S. degree with critical essay in physics or astronomy.

29:245 Quantum Mechanics I **3 s.h.**
Nonrelativistic quantum mechanics, Schrödinger wave mechanics, Hilbert space methods, perturbation theory, scattering, spin and angular momentum, identical particles, selected applications, introduction to relativistic theory. Prerequisites: 29:172 and 29:191.

29:246 Quantum Mechanics II **3 s.h.**
Continuation of 29:245.

29:261 Seminar: Plasma Physics **arr.**
Discussion of current research. Same as 55:291.

29:262 Seminar: Solid State Physics **arr.**
Discussion of current research.

29:266 Seminar: Space Physics **arr.**
Discussion of current research.

29:267 Seminar: Nuclear Physics **arr.**
Discussion of current research.

29:268 Seminar: Elementary Particle Physics **arr.**
Discussion of current research.

29:271 Theoretical Solid State Physics I **3 s.h.**
Central principles of the quantum theory of solids; lattice dynamics, electronic structure, optical properties, superconductivity, magnetism, and other topics; emphasis on viewpoint of elementary excitations. Prerequisites: 29:193 and 29:246.

29:272 Theoretical Solid State Physics II **3 s.h.**
Topics vary from year to year; magnetism; disordered systems; Green's function methods. May be repeated.

29:273 General Relativity and Cosmology **2-3 s.h.**
Einstein's theory of gravitation; applications to astrophysics and cosmology. May be repeated.

29:274 Statistical Mechanics II **3 s.h.**
Advanced topics in statistical mechanics, such as foundations of kinetic theory and nonequilibrium statistical mechanics, quantum statistical mechanics; topics vary. May be repeated.

29:275 Particle Physics **3 s.h.**
Elementary particle properties and phenomenology, quark-parton models, quantum chromodynamics, unified theory of weak and electromagnetic interactions; topics vary. May be repeated.

29:276 Special Topics in Quantum Mechanics **3 s.h.**
Relativistic wave mechanics, second quantization of wave fields, Feynman diagrams, quantum electrodynamics, S-matrix theory, and dispersion relations; selected applications in solid state and nuclear physics. May be repeated.

29:278 Solar-Terrestrial Physics **2 s.h.**
Atmosphere of the sun, and radio and particle emissions therefrom; solar wind; origin and nature of the geomagnetic field; the upper atmosphere of the Earth;

magnetospheres of the Earth and other planets; propagation of energetic particles in the interplanetary medium and their access to the Earth; emphasis varies. May be repeated.

29:281 Research: Physics arr.

29:294 Advanced Plasma Physics I 3 s.h.
Microscopic plasma behavior: statistical mechanics of plasmas; Liouville equation; BBGKY hierarchy; Fokker-Planck equation and relaxation processes; Balescu-Lenard equation; Vlasov equation and linearized wave motion; shocks, nonlinear plasma motions, and instabilities; fluctuations and radiation processes; topics from recent literature. May be repeated. Prerequisite: 29:212 or 29:213 or consent of instructor.

29:295 Advanced Plasma Physics II 3 s.h.
Continuation of 29:294; Macroscopic plasma behavior—transport processes, heating, magnetohydrodynamics. May be repeated.

29:296 Numerical Methods in Plasma Physics 3 s.h.
Consistency and stability in ordinary and partial differential equations, explicit and implicit methods, splitting techniques, ADI, flux-corrected transport, fast Fourier transforms, aliasing, splines, finite elements, elliptic differential equations by iterative and direct methods. May be repeated. Prerequisite: knowledge of FORTRAN and experience with computers.

Astronomy—Primarily for Undergraduates

29:50 Modern Astronomy 3-4 s.h.
Survey of astronomy, including the development of astronomy; the solar system—sun, stars, galaxies, and cosmology. Students registered for 4 semester hours must register for a lab including astronomical observations and analysis of astronomical data. GER: natural sciences.

29:51 Introductory Astronomy Laboratory 1 s.h.
Laboratory portion of 29:50. Prerequisite: 3 semester hours credit in 29:50. GER: natural sciences.

29:61 General Astronomy 4 s.h.
Qualitative and quantitative introduction to the development of astronomy, celestial mechanics, time, electromagnetic radiation, telescopes and astronomical instrumentation, the planets, and smaller solar system objects; laboratory emphasis on observation with telescopes. GER: natural sciences. Open to freshmen. May be taken for 2 s.h. as a sequel to 29:50. Prerequisite: four years of high school math.

29:62 General Astronomy 4 s.h.
Continuation of 29:61, which is not prerequisite; qualitative and quantitative introduction to the properties and evolution of the sun, stars, interstellar matter, and galaxies; cosmology; laboratory emphasis on observation with telescopes. GER: natural sciences. May be taken for 2 s.h. credit as a sequel to 29:50. Prerequisite: four years of high school math.

29:94 Reading in Astronomy arr.

Astronomy—for Undergraduates and Graduates

29:104 Reading in Astronomy arr.

29:119 Introduction to Astrophysics I 3 s.h.
Fundamentals of astrophysical processes in solar system objects, stars, nebulae, the interstellar medium, and galaxies; topics include stellar spectra, binary stars, interstellar gas and dust, stellar and galactic kinematics, stellar evolution, HII regions, radiation processes in galaxies and quasars, stochastic processes in astrophysics. Prerequisites: 29:18 and 29:62, and 22M:26 or 22M:36. Recommended: computer programming experience.

29:120 Introduction to Astrophysics II 3 s.h.
Continuation of 29:119. Prerequisites: 29:19, and 22M:26 or 22M:36.

29:121 Introduction to Astrophysics III 3 s.h.
Continuation of 29:120. Prerequisites: 29:19, and 22M:26 or 22M:36.

29:137 Astronomical Laboratory 2 s.h.
Introduction to techniques and instrumentation in astronomy. May be repeated. Consent of instructor required. Prerequisite: 29:62.

Astronomy—Primarily for Graduates

29:232 Theoretical Astrophysics I 3 s.h.
Radiative transfer, theory of stellar photospheres and continuous spectra of stars, formation of absorption lines in spectra of stars. Consent of instructor required.

29:233 Theoretical Astrophysics II 3 s.h.
The interstellar medium: optical properties of interstellar grains, physical processes in interstellar gas, HII regions, and supernova remnants.

29:234 Stellar Structure and Evolution 3 s.h.
Structure of stellar interiors; nucleosynthesis in stars and evolution of stars. Consent of instructor required.

29:235 Special Topics in Astrophysics 2 s.h.
Advanced lectures on one or more astronomical topics. May be repeated.

29:263 Seminar: Astrophysics arr.
Discussion of current research.

29:282 Research: Astronomy arr.
Original research in observational and theoretical astronomy.

POLITICAL SCIENCE

Chair: James Stimson
Professors: Joel D. Barkan, G. Robert Boynton, John A.C. Conybeare, Chong Lim Kim, Michael S. Lewis-Beck, Douglas K. Madsen, Arthur H. Miller, John S. Nelson, Russell M. Ross, Peter G. Snow, James Stimson
Associate professors: Cary R. Covington, William M. Reisinger, Peverill Squire, John R. Wright
Assistant professors: Timothy M. Hagle, Michael A. Jogerst, Sally Kenney, James M. Lindsay, Lois Sayrs, Vicki Templin
Professors emeriti: Lane Davis, Hugh E. Kelso, Vernon B. Van Dyke
Undergraduate degrees offered: B.A., B.S. in Political Science
Graduate degrees offered: M.A. in Public Affairs; M.A., Ph.D. in Political Science

Undergraduate Programs

Bachelor of Arts

Students seeking the B.A. degree with a major in political science must complete 33 semester hours of course work in political science, including:

30:1 Introduction to American Politics

Four of the following:

30:30 Introduction to Political Thought and Political Action
30:40 Introduction to the Politics of the Industrial Democracies
30:41 Introduction to the Politics of Communist Systems
30:42 Introduction to the Politics of the Third World
30:50 Introduction to Political Behavior
30:60 Introduction to International Relations
30:61 Introduction to American Foreign Policy

Students must earn at least 18 semester hours in political science courses numbered 100 or above. Course 30:192 Washington Internship cannot be included in this total. At least 12 of the required 18 semester hours must be taken in regularly scheduled classroom work. Transfer students must take at least 9 of the 33 semester hours of work in political science at The University of Iowa. Students must maintain at least a 2.00 grade-point average in all political science courses taken at The University of Iowa.

Bachelor of Science

The B.S. degree requires three semesters of mathematics or statistics. The following sets of courses are approved:

22M:17 Quantitative Methods I
22S:102 Introduction to Statistical Methods
22S:148 Intermediate Statistical Methods

22M:17 Quantitative Methods I
22S:8 Quantitative Methods II
6K:71 Statistical Analysis or 6E:85 Economic Statistics

22M:25 Calculus I
22M:26 Calculus II
22S:102 Introduction to Statistical Methods

Other sets of courses may be used with the written approval of the director of undergraduate studies in political science.

Education Major

Undergraduates planning to emphasize political science in their teacher training should consult the College of Education for current requirements.

Honors

The program leading to a B.A. or a B.S. degree with honors is open to students with a minimum cumulative grade-point average of 3.20 overall and in political science. To graduate with honors, students must maintain at least a 3.50 grade-point average in political science and a cumulative grade-point average of at least 3.20. Students are encouraged to take upper-class honors seminars as often as possible, although the program requires only 9 semester hours of upper-class honors course work with a grade of B or higher in each course. Preferably as sophomores, honors students must complete 30:180 Honors Seminar on the Study of Politics. At least one additional upper-class honors seminar, 30:181 Honors Seminar on American Politics, 30:182 Honors Seminar on Political Theory, 30:183 Honors Seminar on Comparative Politics, or 30:184 Honors Seminar on International Politics. The last 3 semester hours required for graduation with honors in political science may be earned by completing 30:185 Honors Research Project, 30:186 Honors Senior Thesis, or a third upper-class honors seminar. Contact the department director of honors for details.

Minor

To receive a minor in political science, students must take 15 semester hours in political science courses, 12 of which must be taken in courses at The University of

Iowa numbered 30:100 and above. Credit in course 30:192 Washington Internship cannot be applied to the minor.

Graduate Programs

At the graduate level, the department has a program leading to a Doctor of Philosophy in political science for students planning academic careers. The Master of Arts in public affairs is a nonthesis program designed for students preparing for careers in government service, public affairs, or in junior and community colleges. The general M.A. degree usually is pursued by persons whose ultimate degree objective is the Ph.D.

Master of Arts in Public Affairs

Completion of this degree requires a minimum of 45 semester hours of credit. Of these, 24 are earned in core courses required of all students, and 21 are earned in electives chosen individually to fulfill special interests. Students are encouraged to use all 21 elective hours in developing applied knowledge and skills in a particular subfield.

The degree does not require a final thesis. In the last semester of course work, students take a written examination that tests both core and specialized knowledge. Students must pass this examination as well as complete all course work with at least a 3.20 grade-point average. All degree requirements must be met by the end of the semester in which the comprehensive examination is taken.

During the final semester, students usually gain practical experience in administrative and policy work through internships in governmental or other public agencies. The internship is jointly supervised by the director of the Master of Arts in public affairs and by the relevant agency head. At the end of the internship, the student submits a final report to the M.A. program director.

Students who do not participate in internships may complete practica—applied seminars focusing on areas such as policy studies or public affairs teaching—in their final term.

Master of Arts with Thesis

Except for the M.A. in public affairs and the M.A. offered under a joint program with the College of Law (see the "College of Law" section of the *Catalog*), the department usually offers the master's degree only as a preliminary step toward the Ph.D.

Students obtain the M.A. degree by completing at least 36 semester hours with a grade-point average of at least 3.25, submitting a thesis, and passing a final oral examination. No more than 8 semester hours of credit for thesis preparation will be counted toward the 36-semester-hour minimum requirement. The final oral examination covers both thesis and course work.

Master of Arts without Thesis

If the evaluation committee convened at the end of the student's first year of courses finds that a student's work provides sufficient evidence of the research and writing skills ordinarily demonstrated in a master's thesis, it may recommend that the student be allowed to proceed with a doctoral program without writing a master's thesis. The requirements for the M.A. without thesis include completion of at least 36 semester hours of graduate work with a grade-point average of at least 3.25 and review of the student's record by a final examination committee, which may waive the final oral examination.

The same requirements apply where a first-year evaluation committee finds the quality of a student's work inadequate for recommending continuation toward the Ph.D. but adequate for proceeding with the master's program. The committee may recommend that the student be permitted to seek the nonthesis M.A. as a terminal degree.

Doctor of Philosophy

The Ph.D. program in political science is designed to prepare students for research, teaching, and scholarly endeavor in academic settings and private or governmental institutions. It produces graduates who are deeply committed to the study of politics, familiar with fundamental knowledge about political processes, well-trained in the methods and techniques for careful investigation of basic and applied research questions, and determined to make contributions to the discipline of political science and to society.

About ten Ph.D. students are admitted each year, so students and faculty work closely, often collaborating with faculty members in research and publication. Graduate students know one another and enjoy supportive and congenial working conditions.

Curriculum

Doctoral study usually lasts four years. In the first year, the curriculum for all students consists of core courses equally divided between substance and methodology. Emphasis is on basic research methods—including quantitative methods—that today's political scientist must thoroughly understand. Special attention is given to research design, collection of observations, analysis and interpretation of data, micro- and mainframe computers, and social science software. Most first-year students complete this training with service as research fellows in investigative projects directed by the faculty.

The second and third years of study are spent in small seminars with focused, substantive topics. Papers written for these seminars might be submitted to journals or read at professional meetings. Students must take their comprehensive examinations by the end of the third year.

The fourth year is spent on dissertation research and writing. Students engaged in basic research and data gathering abroad often require a fifth year to complete the dissertation.

Five fields of study are available: American politics, comparative politics, international relations, political theory, and for those who wish to go beyond the basic methodology training, research methods. Each student chooses three fields of study for the comprehensive examination.

A comprehensive statement of departmental requirements is set forth in the *Guide to Doctoral Study in Political Science*. For general graduate admission and degree requirements, see the "Graduate College" section of the *Catalog*.

Courses

30:000 Cooperative Education Training Assignment **0 s.h.**

30:1 Introduction to American Politics **3 s.h.**
Introduction to the structure and processes of American politics and political institutions, including Congress, the Presidency, the Supreme Court, parties, interest groups, and the bureaucracy; discussion of the framing and significance of the U.S. Constitution. Fulfills Iowa teacher certification requirement. GER: social sciences.

30:30 Introduction to Political Thought and Political Action **3 s.h.**
Illustrates problems, literature, and analytic techniques common in the study. GER: social sciences or humanities.

30:40 Introduction to the Politics of the Industrial Democracies **3 s.h.**
Comparison of western European and/or Japanese systems of government (depending on semester); emphasis on similarities and differences among political parties, interest groups, legislative and executive institutions, policy-making processes, and patterns of voting behavior and citizen participation. May be repeated with consent of instructor. GER: social sciences.

30:41 Introduction to the Politics of Communist Systems **3 s.h.**
Communist systems and society: how they developed, how they solve problems, how they interact (for specific countries, consult current *Schedule of Courses*). May be repeated with consent of instructor. GER: social sciences.

30:42 Introduction to the Politics of the Third World **3 s.h.**
Political systems of the Third World (underdeveloped countries in Africa, Asia, Latin America): their development; how they interact with other Third World countries and with developed countries (for specific countries, consult current *Schedule of Courses*). May be repeated with consent of instructor. GER: social sciences.

30:50 Introduction to Political Behavior **3 s.h.**
Patterns and basis of political behavior, conventional and otherwise; emphasis on common elements in that behavior across social, organizational, and institutional settings. GER: social sciences.

30:60 Introduction to International Relations **3 s.h.**
Theoretical introduction to contemporary international relations. GER: social sciences.

30:61 Introduction to American Foreign Policy **3 s.h.**
Foreign policies of the United States: goals; basic themes and general patterns; problems encountered by policy makers; means employed in dealing with other nations and international organizations; processes by which

policies are formulated; the factors that structure and influence policies. GER: social sciences.

30:100 Understanding Political Research **3 s.h.**
Focus on creating knowledgeable evaluators of current research in political science; interpretation of different quantitative techniques considered, using examples from current political science research; stresses intuitive, rather than mathematical, understanding.

30:110 The American Political System **3 s.h.**
Political behavior of American individuals and groups and institutional structure of political system. Fulfills Iowa teacher certification requirement. Not open to students who have received credit for 30:1.

30:111 Municipal Government and Politics **3 s.h.**
Models of city government, relations to state and federal governments; rights and liabilities of municipalities; city elections, campaigns, and issues; the role of pressure groups.

30:112 Iowa Government and Politics **2-3 s.h.**
Iowa's political parties, political campaigns, constitution, election laws, legislative process, judicial procedures, roles of Iowa governors.

30:113 American State Politics **3 s.h.**
Approaches to analysis of political behavior in American state governments, with emphasis on cultures, parties, actors, processes, issues.

30:114 Political Parties and Pressure Groups **3 s.h.**
Nature, structure, and functions of political parties and interest groups in the United States; development of motivations, nominations, elections, organization, policies in office, lobbying, and campaign contributions; emphasis may vary.

30:115 The Presidency **3 s.h.**
Traces development and current status of the office, powers, and functions of American presidency; recruitment and multiple roles of chief executive; party, congressional, administrative, judicial relationships.

30:116 American Constitutional Law and Politics **3 s.h.**
Role of U.S. Supreme Court in American political system; emphasis on analyzing Supreme Court cases.

30:117 The Politics of Civil Rights and Liberties **3 s.h.**
Defines civil rights and liberties of U.S. citizens; topics include legislative statutes, administrative regulations, and judicial decisions.

30:118 Law and Social Change **3 s.h.**
How law is used to constrain and promote social change; conditions that make laws effective or ineffective.

30:119 Problems in American Politics **3 s.h.**
Selected problems in studying the American political system, including structures, functions, and behavior. May be repeated with consent of instructor.

30:120 Public Administration and Bureaucratic Politics **3 s.h.**
Administrative and organizational theory and behavior; techniques of management; relations between administration and other branches in federal and state governments; administrative politics.

30:121 Urban Administration **3 s.h.**
Problems and principles of urban administration, including tax problems, personnel matters, budgeting, planning, and functional operations of city administrations—police, fire, public health, recreation, social welfare services, and education.

30:126 American Public Policies **3 s.h.**
Functions and policies of national government; emphasis on domestic policy making, impact of public policy.

30:127 Policy Problems in Industrial Societies **3 s.h.**
Focus on public policy problems that governments in North America and Western Europe have dealt with; emphasis on how these governments have confronted policy problems of advanced industrial societies, and political conflicts within those nations over appropriate policy solutions.

30:131 Foundations of Political Theory **3 s.h.**
Major writers and intellectual trends in political thought, from pre-Socratics to the Renaissance and the Reformation.

30:132 Modern Political Theory **3 s.h.**
Major writers and intellectual trends in political thought, from the Renaissance and the Reformation to the nineteenth century.

30:133 Postmodern Political Theory **3 s.h.**
Major writers and intellectual trends in political thought, from the nineteenth century to World War II.

30:134 American Political Theory **3 s.h.**
Analysis of major political writings in America; emphasis on important ideas and their current relevance.

30:135 Introduction to Positive Political Theory **3 s.h.**
Analysis of political issues through the application of rational choice theory to problems of voting, collective action, bargaining, government structure, distributive justice, and revolutionary change.

30:138 Current Political Theory **3 s.h.**
Selected thinkers or schools of thought in political theory, from World War II to the present; topics vary. May be repeated with consent of instructor.

30:139 Political Issues **3 s.h.**
Selected issues in political thought, including democracy, revolution, justice, obligation, technology, and authority; topics vary. May be repeated with consent of instructor.

30:140 Government and Politics of Western Europe **3 s.h.**
Political institutions and processes of selected Western European countries (for specific country or countries under consideration, consult current *Schedule of Courses)*. May be repeated with consent of instructor.

30:141 Introduction to Soviet Government and Politics **3 s.h.**
Development of the Soviet political system and Soviet policies from 1917 to the present; functioning of the political system and current problems in Soviet politics. GER: foreign civilization and culture. Prerequisite: 30:41 or consent of instructor.

30:142 Government and Politics of the Soviet Union and Eastern Europe **3 s.h.**
Institutions, norms, and functioning of Leninist political systems as manifested in the Soviet Union and Eastern Europe in the post-Stalin period; differences among these systems arising from history, culture, level of development, or geography. GER: foreign civilization and culture. Prerequisite: 30:141 or consent of instructor.

30:143 Government and Politics of the Far East **3 s.h.**
Functions and institutions of government in countries of the Far East; special attention to social, economic, and historical environments. GER: foreign civilization and culture. Same as 39:178.

30:144 Latin American Government **3 s.h.**
Governmental institutions and major interest groups; general focus on area as a whole. GER: foreign civilization and culture.

30:145 Major States of Latin America **3 s.h.**
Comparison of political systems of selected major states in Latin America: historical background with emphasis on contemporary political scene. GER: foreign civilization and culture. May be repeated with consent of instructor.

30:146 African Development **3 s.h.**
Problems of economic, political, and spatial integration in Africa; patterns and processes of economic development and nation building. GER: foreign civilization and culture, social sciences. Same as 44:161, 141:146.

30:148 The Politics of Southern Africa **3 s.h.**
Major forces of political conflict in Southern Africa, especially South Africa, and their implications for the development and stability of Africa and the West. GER: foreign civilization and culture. Same as 141:148.

30:149 Problems in Comparative Politics **3 s.h.**
Selected problems in comparative study of political systems, including comparison of structures, functions, and behaviors of different political systems (for current topic, consult current *Schedule of Courses)*. May be repeated with consent of instructor.

30:150 The Political Economy of the Third World **3 s.h.**
Problems of political and economic change common to countries in Africa, Asia, and Latin America: state formation and consolidation, neo-colonialism and dependency, conflicting conceptions of the meaning of development, costs and benefits of alternative strategies for achieving development. Prerequisite: 30:42 or consent of instructor.

30:151 Political Leadership **3 s.h.**
Foundations and effects of leadership in different kinds of political systems.

30:152 The Legislative Process **3 s.h.**
Comparative legislative processes and behavior; focus on legislative systems analysis, legislative institutionalization, legislature and its environment, organizational constraints on legislative behavior, recruitment of legislators, web of legislative interactions, legislative voting behavior. May be repeated with consent of instructor.

30:153 The Judicial Process **3 s.h.**
Role of courts, lawyers, judges, and interest groups in American and selected foreign political systems.

30:154 Political Psychology **3 s.h.**
Study of political phenomena from a psychological perspective; individual-level political behaviors examined include decision making by elites and masses, evaluations of political candidates, mass mobilization, and response to the mass media; psychological concepts examined include stereotyping, social cognition, attitude, and group identification.

30:155 Political Violence and Revolution **3 s.h.**
Causes and consequences of violent political behavior in present and past political systems, including "institutional violence," political crime, political and social movements, rebellion, and revolution.

30:156 Politics of Ethnic and Cultural Conflict **3 s.h.**
Origins, nature, and political consequences of communal cleavage and conflict in selected contemporary societies and international settings. May be repeated with consent of instructor.

30:157 Voting Behavior and Elections **3 s.h.**
Determinants of voting behavior, correlates of political participation and political apathy; political socialization processes and nature and functions of elections.

30:159 Governing in the Future **3 s.h.**
Examines tools for governing that might be used by governments in the future to cope with the rapidly changing set of political problems they are likely to face. Prerequisite: 30:1 Lecture B or differential equations.

30:160 International Politics **3 s.h.**
Concepts and problems in analysis of international politics; war, conflict resolution, and political economy.

30:161 International Organizations **3 s.h.**
Functions of international organizations in contemporary world affairs and their impact on international politics; growth in the number and type of international organizations, bargaining and decision making within international organizations and their impact on international security, global economic issues, development, the environment, and other issues of international order.

30:162 American Foreign Policies **3 s.h.**
Ends pursued, problems encountered, and means employed by the United States in relations with other states and with international organizations. Prerequisite: 30:61 or consent of instructor.

30:163 Inter-American Relations **2-3 s.h.**
Development and application of Monroe Doctrine, especially regarding selected Latin American nations; examination of organization and functioning of Organization of American States and current U.S. policy toward Latin America.

30:164 Military Affairs **3 s.h.**
Analysis of problems relating to armed conflict, actual and potential, including strategic deterrence, military policy making, the role of the military in contemporary political systems, and present-day conflict.

30:166 Politics of War and Peace **3 s.h.**
Origins, purposes, and effects of war in the modern era; examines attempts to eliminate or control war as an instrument of policy; possible alternative methods to secure a peaceful world.

30:167 Nuclear Strategy and Arms Control **3 s.h.**
Introduction to policy: What is U.S. strategic nuclear doctrine? Can nuclear deterrence last out the century? Are there possible solutions to the nuclear dilemma?

30:168 Soviet Foreign Policy **3 s.h.**
Introduction to the patterns of Soviet foreign policy behavior since 1917: How do we understand Soviet goals? What influences the Soviet Union's choice of policies and actions? How successful has it been in pursuing its goals? Prerequisite: 30:60.

30:169 Problems of International Politics 3 s.h.
Selected problems in analysis of international politics (for specific subject, consult current *Schedule of Courses*). May be repeated with consent of instructor.

30:170 The Politics of International Economics 3 s.h.
Introduction to the political and historical dimensions of the international economy; political aspects of trade, monetary systems, foreign investment, aid, dependency, and global interdependence.

30:171 Public Opinion 3 s.h.
Role of public opinion in making public policy; formation and change of political attitudes and opinions; political ideology; measurement of public opinion; understanding how opinion polls are conducted; experience with interviewing and conducting public opinion research. May be repeated with consent of instructor. Same as 34:153.

30:174 Women and the Law 3 s.h.
How laws classify, construct, and affect women; readings in criminal law, family law, constitutional law, and feminist jurisprudence; students analyze proposed legal reforms, consider litigation as a method of social change, evaluate strategies of legal defense groups, review public policies, and consider the impact of women judges, lawyers, and legal scholars. Same as 131:180.

30:179 Crises in the Middle East 3 s.h.
Basic understanding of the dynamics of interstate relations in the Middle East; focus on the major crises in the region over the past two decades; domestic and historical roots of the crises.

30:180 Honors Seminar on the Study of Politics 3 s.h.
History, scope, and method of political science; diverse issues, theories, and techniques in the systematic study of politics.

30:181 Honors Seminar on American Politics 3 s.h.
Ideas, issues, and methods in an area of American politics. Open only to junior or senior honors students in political science or to others with consent of instructor. May be repeated.

30:182 Honors Seminar on Political Theory 3 s.h.
Ideas, issues, and methods in an area of political theory. Open only to junior or senior honors students in political science or to others with consent of instructor. May be repeated.

30:183 Honors Seminar on Comparative Politics 3 s.h.
Ideas, issues, and methods in an area of comparative politics. Open only to junior or senior honors students in political science or to others with consent of instructor. May be repeated.

30:184 Honors Seminar on International Politics 3 s.h.
Ideas, issues, and methods in an area of international politics. Open only to junior or senior honors students in political science or to others with consent of instructor. May be repeated.

30:185 Honors Research Project 3 s.h.
Special research assistance to faculty in political science. Open only to junior and senior honors students in political science. Consent of instructor required.

30:186 Honors Senior Thesis 3 s.h.
Supervised research and writing. Open only to honors students in political science who are not in their last semester of course work before graduation. Consent of instructor required.

30:190 Independent Study arr.
Individually supervised special projects. Consent of instructor required.

30:191 Legislative Internship arr.
For undergraduates participating in state/federal internship programs. Consent of instructor required.

30:192 Washington Internship arr.
Open only to students participating in the Washington Center. Offered only satisfactory/fail. Consent of instructor required.

30:193 Research and Teaching Careers in Political Science 1 s.h.
Introduction to research and teaching activities of faculty in higher education; requirements and opportunities for graduate study, including possibilities for financial assistance; availability of academic and nonacademic job opportunities for students completing graduate training. Offered only satisfactory/fail.

30:200 Introduction to Political Analysis 3-4 s.h.
Conceptual problems of political analysis; empirical research strategies and quantitative techniques.

30:201 Introductory Methodology 3 s.h.
Observational methods and data analysis; critical analysis of applied social research.

30:202 Computing in Political Science 1 s.h.
Exercises on large and small computer systems.

30:203 The Writing of Political Science 2 s.h.
Instruction and practice in writing; focus on writing style and critical thinking; examines use of graphics.

30:210 American Politics 3-4 s.h.
Review and analysis of major literature of American politics, stressing comparative, systemic, and behavioral studies.

30:220 Administrative Theory and Public Policy 3-4 s.h.
Literature and research on organizational and administrative theory, behavior, politics.

30:221 Urban Administration 3 s.h.
Problems and principles of urban administration, including tax problems, personnel matters, budgeting, planning, and functional operations of city administrations—police, fire, public health, recreation, social welfare services, and education.

30:222 Public Policy Analysis I 3 s.h.
Introduction to principal conceptual and methodological tools that can be used to estimate the incidence and severity of particular problems, to predict and measure the effects of alternative policies, and to estimate their relative costs and benefits.

30:223 Public Policy Analysis II 3 s.h.
Applications of the conceptual and methodological tools of policy analysis to a variety of substantive problems and policies. May be repeated with consent of instructor. Prerequisite: 30:222 or equivalent.

30:230 Political Theory 3, 4 s.h.
Introduction to concepts, issues, writers, and works important in the literature of political theory; emphasis on their relevance for understanding and evaluating contemporary politics.

30:231 Introduction to Positive Political Theory 3, 4 s.h.
Introduction to the formal analysis of politics through applications of the theory of games and social choice.

30:240 Comparative Politics 3, 4 s.h.
Current approaches to comparative analysis of political systems; special attention to conceptual and methodological issues.

30:260 International Politics 3, 4 s.h.
Approaches to studying international politics.

30:300 Philosophy of Political Inquiry 3, 4 s.h.
Purposes and methods in study of politics.

30:301 Intermediate Methodology 3, 4 s.h.
Analytical techniques of data analysis; statistical models and relationship of models to hypotheses tested. Prerequisite: one semester of intermediate statistics.

30:302 Time Series Analysis 3, 4 s.h.
Political applications of models of dynamic causality, particularly those associated with Box and Jenkins; major focus on intervention and regular transfer function models for the estimation of causal relationships through time; ARIMA models of noise processes. Prerequisite: 30:301 or equivalent.

30:313 Interest Groups 3-4 s.h.
Analysis of the structure and influence of various types of organized groups in the American and other political systems.

30:314 Political Parties 3-4 s.h.
Systematic investigation of roles, organization, composition, leadership, and functions of parties in the American or other political systems. May be repeated with consent of instructor.

30:315 The Presidency 3-4 s.h.
Analysis of the American chief executive: history, recruitment, behavior, roles, responsibilities, powers, relationships with other institutions.

30:316 Law and Politics 3-4 s.h.
Selected issues of constitutional law and politics in several democratic systems; intensive reading, discussion, scholarly commentaries, and research on doctrinal outputs.

30:319 Problems in American Politics 3-4 s.h.
Selected problems in study of the American political system, including structures, functions, and behavior. May be repeated with consent of instructor.

30:323 Comparative Public Policy Analysis 3-4 s.h.
Theories of public policy formation (decision theory, systems theory, theories of political economy), quantitative research methods for studying policy formation, and research applications in North American and Western European nations.

30:324 Seminar: Urbanization arr.
Problems and consequences of urbanization process; political, economic, and social study of metropolitan areas. May be repeated with consent of instructor. Same as 34:279, 7D:301, 44:337.

30:338 Colloquium in Political Theory 1-4 s.h.
Continuing consideration of issues and works in political theory; no subject repetition in six consecutive semesters. May be repeated with consent of instructor.

30:339 Problems in Political Theory 1-4 s.h.
Selected problems of prescriptive and explanatory political theory. May be repeated with consent of instructor.

30:340 Politics of Western Europe 3-4 s.h.
Selected Western European political systems or political phenomena common to such systems

30:342 Soviet and East European Political Systems 3-4 s.h.
Comparative analysis of the development and functioning of Soviet and Eastern European political systems.

30:343 Asian Political Systems 3-4 s.h.
Comparative study of democratic, transitional, and totalitarian types of government in Asia; special emphasis on leadership recruitment, social control, political participation.

30:349 Problems of Comparative Politics 3-4 s.h.
Selected problems in comparative analysis of politics. May be repeated with consent of instructor.

30:350 Political Economy and Public Policy in Developing Countries 3-4 s.h.
Relationships between political, economic, and social change in selected developing countries and their bearing on formulation of development policy; emphasis on significance of social theory for resolving dilemmas posed by alternative development strategies.

30:351 Political Elites and Leadership 3-4 s.h.
Backgrounds, careers, attitudes, and behavior of political leaders; geographical focus varies with instructor. May be repeated with consent of instructor.

30:352 Legislative Behavior 3-4 s.h.
Systematic analysis of legislative institutions, processes, and behavior; may focus on the United States, Europe, or developing countries. May be repeated with consent of instructor.

30:353 Political Psychology 3-4 s.h.
Study of political phenomena from a psychological perspective; includes decision making by elites and masses, evaluations of political candidates, mass mobilization, and response to the mass media; psychological theories previously employed to explain these behaviors, including stereotyping, social cognition, attitude, group identification, and attribution.

30:354 Political Socialization 3-4 s.h.
Development of political roles, attitudes, orientations; emphasis on theoretical and comparative approaches. May be repeated with consent of instructor.

30:357 Public Opinion and Electoral Behavior 3-4 s.h.
Analysis of political attitudes and beliefs in mass publics; voting behavior; functioning of electoral systems.

30:361 Foreign Policy 3-4 s.h.
Foreign policy making and international behavior in relation to theories and findings from selected countries. May be repeated with consent of instructor.

30:367 Theories of International Political Economy 3-4 s.h.
Examination of theories focusing on the international system, the state, bureaucracies, interest groups, international organizations, bargaining processes, and distributive norms.

30:368 Soviet Foreign Policy 3-4 s.h.
Soviet foreign policy making and international behavior in relation to theories and findings in comparative foreign

policy and world politics; special attention to post-Stalin continuities in Soviet relations with the United States, Eastern Europe, and the developing countries.

30:369 Problems in International Politics **3-4 s.h.**
Intensive examination of selected issues of international politics, emphasizing problems of theoretical analysis. May be repeated with consent of instructor.

30:390 Readings Tutorial **arr.**
Independent individual study. May be repeated. Consent of supervising faculty member required.

30:391 Internships in Public Policy and Administration **arr.**
Consent of supervising faculty member required.

30:392 Practicum in Public Policy and Administration **arr.**
Consent of supervising faculty member required.

30:393 Research Tutorial **arr.**
Individual training in applied research. May be repeated. Consent of supervising faculty member required.

30:395 Master's Thesis **arr.**
Consent of supervising faculty member required.

30:398 Ph.D. Dissertation **arr.**
Consent of supervising faculty member required.

PORTUGUESE

See "Spanish and Portuguese."

PSYCHOLOGY

Chair: James V. Hinrichs
Professors: Robert S. Baron, Joan H. Cantor, Donald D. Dorfman, Don C. Fowles, Stephen S. Fox, Isidore Gormezano, John H. Harvey, James V. Hinrichs, A. Kim Johnson, John F. Knutson, Irwin P. Levin, Lola L. Lopes, Peter E. Nathan, Gregg C. Oden, Michael W. O'Hara, Walter L. Randall, Alan Randich, Milton E. Rosenbaum, Rudolph W. Schulz, J. Richard Simon, Jacob O. Sines, Arnold M. Small, Jerry M. Suls, Edward A. Wasserman
Professors emeriti: Harold P. Bechtoldt, Arthur L. Benton, Charles C. Spiker, Dewey B. Stuit
Associate professors: Carolyn Cutrona, Dee W. Norton
Associate professor emerita: Sue R. Rosner
Assistant professors: Rita J. Casey, Jodie M. Plumert, Lynn D. Zimba
Graduate degrees offered: M.A., Ph.D. in Psychology

Undergraduate Programs

The B.A. and B.S. degree programs in psychology are designed to contribute to a student's general liberal education and to provide a foundation for postbaccalaureate training in psychology and closely related disciplines and in areas such as business, medicine, law, and communications. Students who intend to enter the job market immediately after completing an undergraduate degree are well-advised to complement their psychology major with substantial preparation in another program more closely tied to the world of work (e.g., education, social work, journalism, nursing). Almost all vocational opportunities in psychology require advanced degrees.

The B.S. program is intended for students who plan to pursue advanced work in psychology or in a related discipline. It includes requirements for specific courses in statistics and in experimental psychology, as well as some special requirements in mathematics and natural science. The B.A. program has fewer specific requirements and a less formal emphasis on methodology. Both programs leave ample time for students to combine psychology with another discipline or program.

Students who shift to a psychology major after two years of undergraduate work may find they do not have the background for the B.S. program. They may wish to enrich the B.A. program with courses in experimental psychology and other advanced electives if they intend to pursue graduate work in psychology or in a related field.

Students in either program begin with a general introductory course, followed by one or more methodology courses and electives in several broad areas of psychology: animal learning and biopsychology, child and developmental, clinical, cognitive, and social.

The department maintains excellent facilities to support teaching and research on human and animal behavior. All faculty members are directly engaged in research, and they bring to their undergraduate teaching the excitement that such activity generates. Many opportunities exist for interested and capable students to participate in current research projects in the department.

The department has an active undergraduate organization, the Iowa Students Psychology Association, which is open to all interested students. The group sponsors speakers, films, career days, and student symposia. There also is a local chapter of Psi Chi, the national undergraduate organization of the American Psychological Association.

Bachelor of Arts

Students must satisfy the College of Liberal Arts requirements for the B.A. degree and must complete at least 28 semester hours in psychology. Transfer students must complete at least 15 semester hours of the major at The University of Iowa.

The B.A. program must include the following courses, or equivalents: 31:1 Elementary Psychology or 31:3 General Psychology; 31:143 Introduction to Statistical Methods (same as 7P:143, 22S:102); 31:43 Evaluating Psychological Research or 31:120 Experimental Psychology I; one elective course from four of the five area elective groups below, with at least two of these four area electives in 100-level courses. For students who plan to pursue graduate work in psychology or related areas, 31:120 Experimental Psychology I is strongly recommended along with additional 100-level electives.

Bachelor of Science

Students must satisfy the College of Liberal Arts requirements for the B.S. degree and must complete at least 28 semester hours of credit in psychology. Transfer students must complete at least 15 semester hours of the major at The University of Iowa.

The B.S. program must include the following courses, or equivalents: 31:3 General Psychology or 31:1 Elementary Psychology; 31:142 Introduction to Statistics in Psychology or 31:143 Introduction to Statistical Methods (same as 7P:143, 22S:102); 31:120 Experimental Psychology I; 31:121 Experimental Psychology II; one elective course from each of the five area groupings given below, with at least four of these five area electives in 100-level courses.

Candidates for the B.S. degree in psychology are expected to satisfy the General Education Requirement in natural sciences in one of the following ways: one semester each of chemistry and biology; two semesters of chemistry; two semesters of physics; or one semester each of chemistry and physics. B.S. majors also must complete at least one semester of calculus; in most cases this entails at least one pre-calculus mathematics course. Students should consult with their advisers concerning specific courses that will satisfy these requirements.

Minor

A minor in psychology is an attractive option to students from a variety of disciplines. A minor requires 15 semester hours of credit with a minimum grade-point average of 2.00. At least 12 of those 15 semester hours must be in upper-level courses in this department; this includes all 100-level courses and 31:43. Departmental advisers can help students identify sequences of courses for a minor that appropriately complement the student's major.

Area Electives

Area offerings vary somewhat from semester to semester. Prior to each registration period, students should check the latest version of the brochure, *Undergraduate Psychology at Iowa*, and the current *Schedule of Courses*.

An approved statistics course is a prerequisite to all 100-level courses. For psychology majors, the statistics course must be 31:142 Introduction to Statistics in Psychology or 31:143 Introduction to Statistical Methods (same as 7P:143, 22S:102). Other statistics options are available to non-psychology majors.

Animal Learning and Biopsychology

31:17 Introduction to Comparative Psychology	3 s.h.
31:123 Psychology of Learning	3 s.h.
31:126 Physiological Psychology and Psychobiology	3 s.h.

31:128 Introduction to Behavioral Pharmacology 3 s.h.
31:129 Biological Aspects of Behavior 3 s.h.
31:132 Motivation 3 s.h.
31:135 Principles of Behavioral Analysis 3 s.h.
31:136 Psychology of Pain and Analgesia 3 s.h.

Child and Developmental Psychology

31:14 Introduction to Child Psychology 3 s.h.
*31:103 Development of Children's Social Behavior 3 s.h.
*31:110 Learning and Motivation in Children 3 s.h.
*31:114 Cognitive Development of Children 3 s.h.
*31:166 Developmental Psychopathology 3 s.h.

Clinical Psychology

31:13 Introduction to Clinical Psychology 3 s.h.
31:105 Personality 3 s.h.
31:109 Psychology of Aggression 3 s.h.
31:161 Schizophrenia 3 s.h.
31:162 Depression and Mania 3 s.h.
31:163 Abnormal Psychology 3 s.h.
*31:166 Developmental Psychopathology 3 s.h.
31:170 Behavior Modification 3 s.h.

Cognitive Psychology

31:16 Introduction to Mental Processes 3 s.h.
*31:110 Learning and Motivation in Children 3 s.h.
31:113 Language Processing 3 s.h.
*31:114 Cognitive Development of Children 3 s.h.
31:119 Memory and Cognition 3 s.h.
31:130 Psychology of Thinking 3 s.h.
31:133 Fundamentals of Sensation and Perception 3 s.h.
31:147 Introduction to Psychological Measurement 3 s.h.
31:155 Human Factors Engineering 3 s.h.

Social Psychology

31:15 Introduction to Social Psychology 3 s.h.
*31:103 Development of Children's Social Behavior 3 s.h.
31:106 Attitude Change 3 s.h.
31:107 Environmental Stress 3 s.h.
31:108 Small Group Processes 3 s.h.
31:111 Social Cognition 3 s.h.
31:140 Psychology of Interpersonal Relations 3 s.h.

*These courses may be counted in either—but not both—of the areas indicated.

Honors

The department has an active honors program open to majors with at least a 3.30 grade-point average in psychology courses and at least a 3.20 overall. The program includes research seminars and individual research collaboration with faculty members. Students usually are selected to participate in the department's 31:195 Honors Seminar in Psychology during the spring semester of their junior year. Interested majors should contact the department honors adviser early in their junior year.

Graduate Program

The graduate program in psychology is designed primarily for students seeking the Ph.D. degree. Except in very special circumstances, applications are considered only for that degree. For students entering without previous graduate work, it is a four-year program; those entering with previous graduate training require from two to four additional years in this department, depending on the nature of the earlier preparation.

The Ph.D. program has a strong emphasis on preparation for research, teaching, and scholarly endeavor, whether in academic settings or in industrial, governmental, or medical institutions. The intent is to produce graduates who are deeply committed to the study of psychology, familiar with fundamental knowledge about psychological processes, well trained in the methods and techniques for careful investigation of basic and applied problems, and determined to make contributions to the discipline of psychology and to society.

Graduate training is organized in four broad training areas: clinical psychology, human experimental psychology, neuroscience and behavior, and social psychology. Each entering student is expected to identify one of these as his or her primary area and to follow a program that develops thorough understanding of the substantive material and methods of investigation central to that subdiscipline. While pursuing specialty training, all students must meet course requirements in statistics, research methods, learning, and several content areas other than their primary one.

The department has three areas of research emphasis that cut across the four training areas and combine methodological expertise of faculty and students with special resources within and outside the department: cognitive psychology, developmental psychology, and health psychology. Students who have particular interests in any of these areas may apply to any one of the training areas and indicate a focus in a designated research area. However, students are not required to concentrate their research interest in one of these three areas. Many faculty members have individual and collaborative research projects that contribute to one or more of the research areas. Consequently, students can easily complete the requirements of a training area while developing research knowledge and skills in one or more of the research areas.

The training area programs are sufficiently flexible to permit students to develop substantial competence in a second training area. Several joint programs have been formulated and others can be developed as student interest dictates. A joint program involves mixing course work in two areas, and research supervision or co-supervision by faculty members from both areas. The department also is prepared to help students develop additional expertise in any of the following interest areas: human factors, aging, organizational and consumer behavior, communications, and cognitive science. Preparation in one of these interest areas involves some special advanced seminars within the department, selected courses in other departments of the University, and participation in one or more research projects in the interest area.

Doctor of Philosophy

The Ph.D. degree requires satisfactory completion of at least 72 semester hours of graduate work in psychology, including at least 33 semester hours in this department. All students must satisfy, through one of several options, requirements in statistics and research methods, and in learning. A course in the history and/or the philosophy of psychology is strongly encouraged. Students also are expected to take sufficient course work outside the primary training area to develop a reasonably broad background in the discipline of psychology as a whole. The nature of these requirements and their placement in the graduate program varies somewhat among the training areas and depends on the individual student's background and interests.

During each of the first three semesters, graduate students ordinarily take three courses: for example, a general core course, a course in the primary training area, and an outside area elective. Students also become familiar with the literature, research strategies, and special techniques in one or more research areas through engagement in individually supervised research projects. This research participation—which may be with one faculty member all year long or with a different faculty member each semester—is designed to help students develop, by early in the second year, a reasonably detailed plan for the master's research project.

By the end of the second year—certainly very early in the third year—students are expected to have completed their master's project and to have defended their thesis. Advancement to Ph.D. candidacy is based on a faculty-wide review of the student's overall record of performance on the M.A. project, in course work, and in teaching, research, and service.

During the third year, students continue selected course work in the training and interest areas, develop a prospectus for the dissertation research, and prepare for the comprehensive examination. This written examination covers material in the specialty and in related areas and ordinarily is given at the beginning of the fourth year. The fourth year is devoted primarily to advanced seminars and to conducting the Ph.D. study and preparing the dissertation.

In the Ph.D. final examination, students present an oral defense of their dissertation and are expected to relate the dissertation work to broader issues in the discipline of psychology.

Master of Arts with Thesis

As indicated above, the department does not offer a specific M.A. program. The M.A. degree with thesis is a required step for students preparing for the Ph.D. This degree requires satisfactory completion of at least 30 semester hours of graduate course work in psychology, 18 of which must be taken at The University of Iowa. The course work must include the statistics sequence, a learning course, and at least one course outside the primary specialty area. Students also must complete an acceptable scholarly thesis and conduct a successful oral defense of the thesis.

Master of Arts without Thesis

The M.A. degree without thesis is an option available to those few students who terminate their work in the department after four semesters. This degree requires satisfactory completion of at least 38 semester hours of graduate credit in psychology, 24 of which must be taken at The University of Iowa. The course work must include the statistics sequence, a learning course, and at least one course outside the primary area. Students also must perform successfully on a written examination covering their area of specialization.

Graduate Training Areas

Clinical Psychology

The clinical training program, fully approved by the American Psychological Association, strongly emphasizes a scientific approach to the study of psychopathology. It is designed for students who are primarily interested in developing scholarly understanding of clinical phenomena and acquiring research skills necessary to the systematic investigation of such phenomena. Recognizing that students must become familiar with clinical material and competent in the application of clinical skills, the department closely integrates practicum experience in the Carl E. Seashore Psychology Clinic with course work and supervised research experience.

Students in the clinical program may develop special competence in areas such as psychophysiology, personality, aggression, the affective disorders, behavioral and cognitive therapies, child psychopathology, and clinical health psychology. Faculty members collaborate actively with colleagues from departments such as otolaryngology, psychiatry, pediatrics, obstetrics and gynecology, and surgery, and from other units, such as the Center for Health Services Research, the School of Social Work and its Gerontology Program, and nearby area education agencies. Partly as a consequence of such collaboration, behavioral medicine and aging are interest areas in which a number of clinical faculty members are prepared to offer research supervision. Within the department, joint training programs combining a clinical specialty with work in other training areas have been established and are available to students with strong interests in two specialty areas.

Advanced students have opportunities to gain additional practicum experience through placement in clinical facilities maintained by local, state, and University agencies. Students in the clinical program who wish to have the designation "clinical psychology" on their official transcript must satisfactorily complete a one-year internship at an approved agency before receiving the doctoral degree. The internship ordinarily comes after completion of all course work and of most, if not all, of the dissertation project.

Human Experimental Psychology

Students affiliated with the human experimental program concentrate their training in the broad areas of perception and cognition, information processing, and learning. Current faculty members specialize in the following areas: learning, memory, and problem solving in children; language and cognition; mathematical psychology, psychophysical scaling, and signal detection theory; cognitive effects of drugs; human judgment and decision making; information processing; visual perception; and psychoacoustics.

Faculty members in the human experimental area are prepared to help students gain additional expertise in a variety of interest areas, including human factors, communications, aging, and organizational and consumer behavior. Collaborative research is under way with faculty members from the College of Business Administration, the Center for Health Services Research, and several departments, including neurology, industrial engineering, speech pathology and audiology, and anesthesia.

Neuroscience and Behavior

The focus of the program in neuroscience and behavior is on the analysis of learning and motivation, primarily in nonhuman subjects, through the application of behavioral and biological principles. Special faculty strengths are in classical and operant conditioning, comparative psychology, motivation, neuropharmacology, neuroendocrinology, and neuroanatomy. Students in this program have the opportunity to learn state-of-the-art techniques in computer-controlled experimentation and electronic instrumentation, and modern analytic and laboratory methods in neurosurgery, histology, and biochemical assay.

Faculty members in the neuroscience and behavior area interact extensively with colleagues from a number of basic science departments in the College of Medicine. These collaborative activities provide excellent research and training opportunities for students interested in emerging interdisciplinary fields such as behavioral medicine and neuroscience.

Social Psychology

The social psychology program offers a variety of perspectives on social processes. Students develop some familiarity with all of the approaches but may focus their graduate training in any of several subareas, such as attitudes, social cognition, attribution, social influences on behavior, close relationships, the social psychology of groups, and the study of social psychological aspects of clinical problems and processes.

Students in the social psychology program also may acquire additional preparation for research and teaching in interest areas such as organizational and consumer behavior, communications, human factors, and behavioral medicine. Such preparation, which ordinarily will involve selected course work outside the department (e.g., in the College of Business Administration or the Department of Communication Studies) and participation in special research projects, will broaden students' employment prospects.

Admission

Since the graduate program in psychology is designed primarily for students seeking the Ph.D. degree, all applicants are considered on this basis. Occasionally, a qualified applicant interested in advanced work only through the M.A. level may be admitted to pursue a joint graduate program involving psychology and another discipline or profession. A person interested in such a program should contact the department chair before filing an application.

The deadline for applications is February 1. For all materials to be on file by that date, the Graduate Record Examination (GRE) General Test should be taken in October, certainly no later than in December. The subject test in psychology is not required. Applications may be submitted at any time but are considered only once each year—between February 1 and March 15—for admission the following fall. Admission decisions are based on a composite consideration of prior academic performance, letters of reference, scores on the verbal, quantitative, and analytic sections of the GRE General Test, and the applicant's statement about background and purpose. Initial review of admission materials is done by faculty members in the applicant's primary training area.

An undergraduate major in psychology—including a laboratory course in experimental psychology, a course in statistics, and additional work in the natural

sciences and in mathematics—is desirable but not required. Students who have not had such a background but are strongly qualified on other grounds may be admitted. They will be expected to remedy deficiencies through special course work or independent study prior to embarking on the regular graduate program.

A student who has completed substantial graduate work at another institution before being admitted to The University of Iowa's psychology program is expected to present documents, such as a master's thesis or equivalent, that reflect significant engagement in research and scholarly writing. This material and the record of previous graduate course work is reviewed by the faculty members of the appropriate training area as a basis for placement in the graduate program. In no instance are students permitted to complete substantial research or writing for a master's degree at another institution while they are regular full-time students in the graduate program at The University of Iowa.

A foreign language is not required for admission, and there are no foreign language requirements for either the M.A. or the Ph.D. degree in psychology.

Financial Aid

All students admitted to the graduate training program in psychology automatically are considered, on the basis of merit, for available financial support in the form of fellowships, teaching assistantships, research assistantships, traineeships, and tuition scholarships. No separate application for financial aid is required.

Faculty

The widely recognized commitment of the faculty to research and scholarship is manifest in the publication of nearly 100 articles, books, reviews, and book chapters each year. Many faculty members also are active as editors, associate editors, and regular consulting editors for major psychology journals.

Facilities

The department's facilities for graduate training and research are among the finest in the country. The Kenneth W. Spence Laboratories of Psychology and adjoining space in Seashore Hall include a variety of laboratories, many computerized, for human and animal studies. Facilities include three separate animal housing areas; a histology laboratory; observation suites with remote audiovisual control and recording equipment; soundproof chambers; closed-circuit TV systems; electrophysiological recording rooms; conditioning laboratories; the Carl E. Seashore Psychology Clinic; and well-equipped electronic, mechanical, and woodworking shops.

The University's Weeg Computing Center currently operates an IBM 4381, five PRIME systems, and a VAX 6410. Students and faculty have ready access to these systems through terminals in the department and through a satellite computer facility in Seashore Hall. Microcomputers of many kinds are widely available. Office space for graduate students and faculty is provided in Seashore Hall. The psychology branch of the University's Main Library, with major collections in all areas, is conveniently located in the west wing of Seashore Hall.

The research and teaching activities of the department greatly benefit from the facilities and staff of other University and local agencies, including The University of Iowa Hospitals and Clinics, the Psychiatric Hospital, the Veterans Administration Medical Center, the University Counseling Service, the Child Development Clinic, the Wendell Johnson Speech and Hearing Clinic, the Center for Health Services Research, and the School of Social Work gerontology program.

Courses

Primarily for Undergraduates

31:1 or 31:3 or equivalent is prerequisite to all other psychology courses. Only one of these may be taken for credit.

31:4, 31:13, 31:14, 31:15, 31:16, 31:17, and 31:19 are open to freshmen who have satisfactorily completed an introductory psychology course (31:1 or 31:3 or equivalent).

31:1 Elementary Psychology **3-4 s.h.**
Overview of psychology as a behavioral science; faculty members present lectures in their areas of expertise; students are required to become familiar with methods of investigation in psychology through participation in demonstration-discussions and in actual research studies, or through preparation of research reports. GER: social sciences. Not offered pass/nonpass.

31:3 General Psychology **4 s.h.**
Introduction to psychology as an experimental science; focus on methods of investigation in psychology. GER: social sciences. Open to honors students, B.S. majors, and other qualified students with consent of instructor. Not offered pass/nonpass. Prerequisite: high school preparation in mathematics and science.

31:4 Honors in the Biology of Behavior **3 s.h.**
Behavior and its anatomical and physiological substrates; emphasis on homeostasis and biological rhythms; critical appraisals of current research in the biology of behavior. Open to honors students or to others with consent of instructor.

31:13 Introduction to Clinical Psychology **3 s.h.**
Survey of current and historical developments in clinical psychology; consideration of contemporary methods in assessment and treatment of psychological disorders. GER: social sciences.

31:14 Introduction to Child Psychology **3 s.h.**
Survey of current research and theory in child psychology, including heredity and environment, infancy, perceptual development, attachment, language acquisition, thinking (Piaget), information processing, memory and concept development, intelligence, child rearing, peers, sex differences, moral development, aggression, and child psychopathology. GER: social sciences.

31:15 Introduction to Social Psychology **3 s.h.**
Research relating behavior of individual human organisms to factors in social environment; socialization and acculturation, attitude development and change, attributional processes, social influences on perceptual and conceptual processes, social interactions, close relationships; contributions by sociologists and anthropologists.

31:16 Introduction to Mental Processes **3 s.h.**
Survey of the study of individual human cognition; perception, attention, memory, language, learning, problem solving, decision making, and thought considered from information-processing viewpoint. GER: social sciences.

31:17 Introduction to Comparative Psychology **3 s.h.**
Behavioral processes in humans and animals; intelligence, memory, attention, language, and consciousness; behaviorism, mentalism, evolution, and neuropsychology. GER: social sciences.

31:19 Psychology in Business and Industry **3 s.h.**
Applications of psychology to problems in the world of work; emphasis on personnel selection, training, attitudes, motivation, measurement of job performance.

31:43 Evaluating Psychological Research **4 s.h.**
Development of skills required to critically evaluate the professional and public literature dealing with the scientific study of behavior: philosophy of scientific psychology, experimental and nonexperimental methods of investigation, principles of experimental design and control, psychological testing, and discussion of applications in serveral areas of research. Additional prerequisite: 31:143 or 31:142 or equivalent.

For Undergraduates and Graduates

An approved statistics course—7P:25, 22S:25, 7P:143, 31:143, 22S:102, 6K:71, 22S:8, 31:142, 34:10, or equivalent—is prerequisite to all 100-level psychology courses. 31:142 or 31:143 satisfies the statistics requirement for psychology majors. Exceptions are 31:120, 31:121, 31:142, 31:144, and 34:147, which have different prerequisites. 31:1 or 31:3 or equivalent is prerequisite to all other psychology courses. Only one of these may be taken for credit.

31:103 Development of Children's Social Behavior **3 s.h.**
Basic processes affecting children's responses to the social environment; attachment and dependency, social reinforcement, imitation, and moral development.

31:105 Personality **3 s.h.**
Determinants, correlates, consequences of adjustive functions and personality development.

31:106 Attitude Change **3 s.h.**
Current theoretical approaches to attitude change; laboratory and field methods of research; consideration of basic processes of change within broader framework of psychology.

31:107 Environmental Stress **3 s.h.**
Social psychological aspects of urban living, crowding, control, institutionalization, and energy utilization; theory and research on stress, arousal, and emotion.

31:108 Small Group Processes **3 s.h.**
Classic work on group processes stressing laboratory experiments, field studies and observations, relevant theory; topics may include conformity, reference groups, cohesion, contagion, group performance, response diffusion, decision making, conflict. Recommended: 31:15.

31:109 Psychology of Aggression **3 s.h.**
Examination of major theories and research on aggressive behavior in human and nonhuman subjects; implications of research on aggression for understanding contemporary social problems.

31:110 Learning and Motivation in Children **3 s.h.**
Survey of research and theory on children's conditioning, discrimination learning, verbal learning and memory, transfer-of-training, and motivational systems.

31:111 Social Cognition **3 s.h.**
Examination of cognitive processes as they affect, and are affected by, social situations; person perception, social memory, attribution theory, and other areas of social cognition.

31:113 Language Processing 3 s.h.
Basic linguistic processes within the context of cognitive psychology; speech perception, syntax, and semantics; additional treatment of language acquisition. Same as 103:115.

31:114 Cognitive Development of Children 3 s.h.
Developmental research and theory concerning children's information processing, verbal concepts, thinking, and problem solving.

31:116 Psychology of Sex Differences 3 s.h.
Topics on the nature of sex differences in behavior, possible sources of those differences, and the importance of sex differences in the lives of males and females; emphasis on experimental literature in psychology.

31:119 Memory and Cognition 3 s.h.
Introduction to contemporary psychological theory and research on short-term and long-term memory, acquisition processes, and related topics in cognition.

31:120 Experimental Psychology I 3 s.h.
Logic and application of experimental methods to analysis of behavioral phenomena; overview of some major problem areas of experimental psychology. Prerequisite: 31:142 or 31:143 or equivalent.

31:121 Experimental Psychology II 4 s.h.
Laboratory study of some aspect of behavior; each section deals with topics in a particular area (e.g., learning and memory, perception, social behavior, operant behavior, physiological processes). May be repeated. Prerequisite: 31:120 or equivalent; some sections may require additional prerequisites.

31:123 Psychology of Learning 3 s.h.
Theoretical and experimental bases of learning in animal and human behavior.

31:126 Physiological Psychology and Psychobiology 3 s.h.
Introduction to basic concepts and techniques in the neurosciences and their application to the analysis of sensory processes, arousal mechanisms, motivation, and learning.

31:127 Psychology of Dependency Behavior 3 s.h.
Review of methodological and theoretical problems involved in psychopharmacological research; consideration of social, psychological, sociological, anthropological, and legal factors.

31:128 Introduction to Behavioral Pharmacology 3 s.h.
Behavioral consequences of drugs; emphasis on experimental findings from studies with animals, including man.

31:129 Biological Aspects of Behavior 3 s.h.
Biological bases of various behaviors (e.g., temperature regulation, sexual activity) discussed in terms of the neuroanatomical substrate, the neuroendocrine pathways, and the autonomic nervous system; homeostasis and biological rhythms.

31:130 Psychology of Thinking 3 s.h.
Problem solving, reasoning, judgment and decision making, language and thought, intelligence, and creativity. Recommended: 31:16 or 31:119.

31:132 Motivation 3 s.h.
Recent contributions to motivational research; examines methodologies and implications of contemporary theory.

31:133 Fundamentals of Sensation and Perception 3 s.h.
Recent developments in experimental and theoretical approaches to perception; emphasis on physiological and behavioral results derived from studies of visual functions.

31:135 Principles of Behavioral Analysis 3 s.h.
Introduction to the experimental analysis of behavior; application of behavior analysis to a broad range of topics in psychology, including reflexive behavior, perception, learning, motivation and emotion, memory and cognition, language, abnormal behavior, drug addiction, and social behavior; consideration of the behaviorist philosophy.

31:136 Psychology of Pain and Analgesia 3 s.h.
Physiology, pharmacology, anatomy, and psychology of systems mediating the perception of pain and the production of analgesia; unconditioned and conditioned aversive states as they relate to the psychobiology of emotion.

31:137 Transpersonal Theory 3 s.h.
The process of personality development; emphasis on comparison of Gestalt, experiential, and existential psychologies with contemporary ego theories, psychoanalytic theories, and more deterministic conditioning and environmental-influence theories.

31:138 Love, Power, and Justice 3 s.h.
Consideration of psychological, philosophical, and legal issues concerning the individual's role in a complex society.

31:140 Psychology of Interpersonal Relations 3 s.h.
Social psychological theories and findings on how people make attributions about one another, present themselves to one another, and change in their relationships over time; factors that affect close personal bonding, psychological effects of terminating such bonding.

31:142 Introduction to Statistics in Psychology 3 s.h.
Analysis and interpretation of data from research studies in psychology; descriptive statistics, the logic of statistical inference, simple experimental designs, and introduction to correlation and regression.

31:143 Introduction to Statistical Methods 3 s.h.
Same as 7P:143, 22S:102.

31:144 Intermediate Statistics in Psychology 3 s.h.
Planning and analysis of research studies in psychology; introduction to the design and analysis of experiments, multiple correlation and regression, and selected nonparametric techniques; some computer analysis packages introduced. Prerequisite: 31:142 or 31:143 or equivalent.

31:147 Introduction to Psychological Measurement 3 s.h.
Introduces the basic concepts and techniques of psychophysical and psychometric measurement; classical and modern psychophysics such as signal detection theory, unidimensional and multidimensional scaling, and classical and modern mental test theory. Prerequisite: 31:142 or 31:143 or equivalent. Recommended: introductory calculus course.

31:150 Psychology of Aging 3 s.h.
Overview of psychological aspects of the aging process: neuropsychological changes, sensory and perceptual functioning, cognitive processes, intellectual performance, and personality; psychosocial characteristics of the aged.

31:151 Psychobiology of Behavioral Medicine 3 s.h.
Behavioral and physiological mechanisms underlying psychosomatic illnesses such as hypertension.

31:155 Human Factors Engineering 3 s.h.
Design of man-machine systems and development of optimum work environment by applying principles of behavioral science; emphasis on sensory and perceptual processes, motor skills, experimental methodology. Same as 56:142.

31:156 Psychology in Management 3 s.h.
Application of psychological principles to human relationships and supervision; motivation, leadership, communication, group pressures. Same as 56:145.

31:161 Schizophrenia 3 s.h.
In-depth examination of nature of schizophrenia; theories and research in selected topics, such as clinical features, premorbid adjustment, genetic vs. environmental influences, cognitive deficits, and pharmacological and psychological treatment. Recommended: 31:13 or equivalent.

31:162 Depression and Mania 3 s.h.
Review of symptoms, treatment, and theories about causes of depressive disorders (e.g., major depression, bipolar depression). Recommended: 31:13 or equivalent.

31:163 Abnormal Psychology 3 s.h.
Review of the major adult psychiatric disorders, (e.g., neurosis, psychopathy, schizophrenia, depression); emphasis on the application of basic concepts to theories of etiology.

31:166 Developmental Psychopathology 3 s.h.
Review of major forms of childhood psychopathology; current theoretical approaches and methodological issues in the diagnosis, conceptualization, and treatment of developmental psychopathology. Recommended: 31:14 or equivalent.

31:170 Behavior Modification 3 s.h.
Basic approaches to the modification of clinically distressing behavior; learning theory principles underlying the techniques, translation into procedures, and experimental evaluation of effectiveness.

31:171 Behavioral Medicine 3 s.h.
Role of psychological factors in physical health and illness; relationship between personality characteristics and various physical conditions; behavioral processes in the etiology and treatment of certain disorders; coping mechanisms and psychosocial responses to prolonged and/or traumatic illness. Additional prerequisite: 31:163 or 31:166 or equivalent.

31:180 Current Topics in Psychology 2-3 s.h.
May be offered in more than one section, each section dealing with the critical appraisal of an important current topic. May be repeated.

31:185 Research Practicum in Psychology arr.
Small-group participation in faculty research projects; includes literature review, planning of studies, data collection, analysis, interpretation, and write-up. May be repeated. Offered only satisfactory/fail. Consent of instructor required.

31:191 Special Readings and Projects arr.
Open only to undergraduate majors in psychology. Offered only satisfactory/fail. Consent of department chair and sponsorship of staff member required.

31:195 Honors Seminar in Psychology 3 s.h.
Lectures, readings, and discussions in a variety of psychology research areas; leads to choice of topic for honors project. Open only to honors students. Offered only satisfactory/fail. Consent of instructor required.

31:199 Honors Thesis Research 1-3 s.h.
Supervised original research project leading to written thesis and oral defense. Open only to honor students.

Primarily for Graduates

31:201 Theory and Methods in Social Psychology 3 s.h.
Classic and contemporary theory in social psychology; related methodological topics.

31:202 Attitude Development and Change 3 s.h.
Review of current theories about attitude formation and change; consideration of laboratory and field research methods; analysis of basic processes of change. Prerequisite: 31:106 or equivalent or consent of instructor.

31:203 Social Perception and Attribution 3 s.h.
Theory and empirical analysis of perception of persons and attributions concerning internal processes; consideration of determinants of impression formation, attraction, and behavioral prediction.

31:206 Social Cognition 3 s.h.
Human perception, memory, and judgment processes as they relate to social phenomena and human interaction.

31:207 Interpersonal Relationships 3 s.h.
Theoretical and empirical analysis of interpersonal attraction, affiliation, cooperation and competition, group formation and process, and intergroup relations.

31:208 Psychology of Close Relationships 3 s.h.
Theory, general writing, and empirical analysis of variables involved in the initiation, maintenance, and termination of close relationships; emphasis on social psychological processes and concepts.

31:209 Psychology of Stress 3 s.h.
Theory and research on stress and emotion; learned helplessness, loss of a loved one, social support, coping strategies, overload, institutionalization, and urban stress.

31:211 Processes in Social Development 3 s.h.
Critical analysis of theory and research about social development from infancy to adulthood; emphasis on temperament, attachment, emotion, aggression, pro-social behavior, peer relationships, and moral development. Consent of instructor required.

31:212 Early Perceptual-Cognitive Development 3 s.h.
Examination of knowledge acquisition during the first two years of life; development of visual, speech, and bimodal perception; imitation; object concept and permanence; early perceptual concepts.

31:215 Philosophy of Modern Psychology 3 s.h.
Analysis and discussion of the scientific method in its application to modern psychology; laboratory exercise in analyzing psychological research.

31:216 Verbal Processes in Children 3 s.h.
Analysis of theory and research concerning the acquisition of semantic concepts and the development of memory processes.

31:217 Advanced Developmental Psychology 3 s.h.
Analyses of developmental theory, methodology, and representative fields of investigation.

31:218 Cognitive Development 3 s.h.
Survey of classic and current theories of human cognitive development; topics include Piaget's theory and conceptual development.

31:221 Motivation and Emotion 3 s.h.
Critical review of the concepts of motivation and emotion as determinants of behavior; instincts, Hull-Spence Theory, opponent-process theory, two-factor theory of avoidance, models of drug addiction and tolerance, and biological basis of homeostatic and nonhomeostatic behaviors.

31:222 Conditioning and Learning 3 s.h.
Methodology, results, interpretation of conditioning, and simple learning experiments with humans and animals.

31:223 Information Processing in Psychology 3 s.h.
Information-processing approaches to theoretical analysis of complex behavior; theoretical concepts including information theory, mechanical models, and computer simulation reviewed and applied to selected empirical topics.

31:224 Sensory Processes 3 s.h.
Methods, concepts, and results of research relating to processes by which an organism obtains information about its environment.

31:225 Learning, Memory, and Cognition 3 s.h.
Survey of the historical development and current theories of human symbolic behavior; emphasis on acquisition, retention, and use of verbal associations; visual imagery, simple decision making, concept formation, problem solving, choice behavior. Same as 103:272.

31:226 Visual Perception 3 s.h.
Selected experiments and theories relating variation in visual stimulus properties and cortical mechanisms to differential responding in visual recognition and discrimination tasks.

31:227 Introduction to Behavioral Neuroscience 3 s.h.
Basic facts and concepts in the behavioral neurosciences; special emphasis on relationship and relevance to behavior of the concepts and facts of evolution, neuroendocrinology, homeostasis, biological rhythms, and neuroanatomy.

31:230 Behavioral Pharmacology 3 s.h.
Behavioral analysis of drug action in experimental animals, including man; special emphasis on physiological and biochemical mechanisms underlying various behavioral processes in experimental animals and in human psychopathology.

31:237 Experimental Analysis of Behavior 3 s.h.
Inquiry into the determinants of operant behavior; special emphasis on philosophy and methodology of Skinner's behaviorism; evaluation of the application of operant behavior analysis to human affairs.

31:238 Human Psychophysiology 3 s.h.
Review of basic concepts and issues in psychophysiology; emphasis on application to research in clinical and/or social psychology.

31:239 Laboratory in Human Psychophysiology 2-3 s.h.
Introduction to basic bioelectric principles, laboratory apparatus (DC vs. RC preamplifiers, filters, integrators), psychophysiological recording techniques (electromyogram, heart rate, electrodermal activity), data reduction and analysis.

31:240 Human Judgment: Models and Applications 3 s.h.
Analysis of models and methods used in the study of human judgments and decisions; description of applications in areas such as clinical diagnosis, social and educational evaluations, economic judgments, consumer decisions.

31:244 Behavioral Neuroscience 2 s.h.
Lecture and laboratory; basic principles of neurochemistry, neuropharmacology, developmental neuroscience, and behavioral neuroscience. Offered fall semesters. Consent of instructor required. Same as 132:244, 71:244.

31:245 Quantitative Methods in Psychology 3 s.h.
Mathematical methods necessary for understanding and using mathematical models in psychology; applications considered; short review of calculus.

31:246 Statistical Analysis II 4 s.h.
Includes planning and analysis of more complex investigations and experiments, simple and multiple correlation, trend analysis, multiple regression analysis, covariance, and introduction to multivariate analysis. Consent of instructor required.

31:248 Psychophysics and Scaling 3 s.h.
In-depth survey of theoretical and empirical literature in psychophysics and scaling; practical applications.

31:250 Introduction to Health and Behavioral Science 3 s.h.
Evolution of the behavioral medicine area; survey of the major physiological systems in which pathology is affected by behavioral processes; review of theoretical approaches and experimental paradigms from behavioral science as they may apply to the assessment of health problems. Consent of instructor required.

31:256 Pain and Analgesia 3 s.h.
Pain and analgesia from neural substrates to therapeutics.

31:260 Descriptive Psychopathology 3 s.h.
Detailed consideration of psychiatric syndromes, including description, etiology, experimental and clinical research; development and function of classification systems. Consent of instructor required.

31:261 Experimental Psychopathology 3 s.h.
Survey of theories of the psychobiological processes underlying the etiology of psychopathology; emphasis on schizophrenia, affective disorders, anxiety, sociopathy, and drug abuse.

31:262 The Affective Disorders 3 s.h.
Critical review of theory and research on depression and related syndromes, including consideration of definitional problems, etiological factors, and treatment approaches.

31:263 Psychological Appraisal I 3 s.h.
Examination of background, development, administration, and scoring of selected psychological techniques used in the clinical assessment of children and adults. Consent of instructor required.

31:264 Psychological Appraisal II 3 s.h.
Detailed consideration of the clinical use and interpretation of selected psychological assessment techniques; emphasis on research evidence of their validity and utility. Consent of instructor required. Prerequisite: 31:263 or equivalent.

31:265 Neuroscience Seminar 0-1 s.h.
Conceptions of brain-behavior relationships in man; analysis of behavioral disturbances associated with cerebral abnormality; current application of psychological test methods for inferring cerebral status. Same as 37:265, 60:265, 72:265, 132:265.

31:268 Clinical Child Psychology 3 s.h.
Consideration of the assessment, diagnosis, and treatment of behavioral disorders of children; treatment approaches include the behavioral, psychoanalytic, nondirective, and pharmacological.

31:269 Theory and Techniques of Psychotherapy 3 s.h.
Survey course in major psychological techniques of behavior change; critical evaluation of theories and techniques.

31:271 Psychoacoustics 3 s.h.
Same as 3:254.

31:272 Psychoacoustics Laboratory 4 s.h.
Same as 3:255.

31:275 Behavioral Therapy 3 s.h.
Learning or conditioning approaches to treatment of psychopathology, including classical conditioning, operant conditioning, systematic desensitization, social learning, and cognitive/self-control approaches.

31:276 Advanced Developmental Psychopathology 3 s.h.
Detailed consideration of psychiatric syndromes manifested in childhood and adolescence; review of theoretical approaches and methodology from developmental and clinical psychology as they apply to study of childhood psychopathology. Consent of instructor required.

31:277 Marital and Family Therapy 3 s.h.
Theoretical foundations, clinical procedures, and research investigations relative to treatment of families and couples; emphasis on behavioral and systems approaches to intervention; includes live and videotaped demonstrations of intervention strategies, along with practice in clinical interviewing with couples.

31:290 Instruction in Psychology 1-2 s.h.
Topics related to classroom teaching of psychology, including preparation of lectures, exams, homework assignments, and term papers; elements of successful teaching.

31:291 Problems in Psychology arr.
Readings and papers under individual guidance of staff member. Consent of instructor required.

31:295 M.A. Thesis Research arr.
Consent of instructor required.

31:296 Ph.D. Dissertation Research arr.
Consent of instructor required.

31:297 Research Projects arr.
Consent of instructor required.

31:301 Seminar: Personality 2 s.h.
Systematic review of selected topics. May be repeated. Consent of instructor required.

31:302 Seminar: Social Psychology 2 s.h.
Review of selected topics. May be repeated. Consent of instructor required.

31:303 Advanced Topics in Social Psychology 0-2 s.h.
Recent theory and research in social psychology.

31:308 Seminar: Clinical Child Psychology 0-2 s.h.
Review of selected theoretical and methodological issues related to child clinical psychology. Consent of instructor required.

31:315 Seminar: Social Development 2 s.h.
Selected topics in social judgment and behavior. Consent of instructor required.

31:316 Seminar: Problems in Developmental Psychology 2 s.h.
Consideration of selected methodological and theoretical issues in developmental psychology. Consent of instructor required.

31:320 Seminar: Planning and Decision Making 2 s.h.
Theory and experimentation with psychological models of planning and decision making; emphasis on materials from cognitive psychology with related readings from artificial intelligence, management science, and law.

31:333 Seminar: Memory 2 s.h.
Contemporary theoretical viewpoints regarding the nature of human memory; discussion of recent research findings.

31:335 Seminar: Cognitive Neuroscience 0-2 s.h.
Neurological and behavioral investigations of attention, perception, learning, memory, decision making, and planning; contemporary models and theories. Consent of instructor required.

31:338 Seminar: Animal Learning and Biopsychology 0-2 s.h.
Selected topics on recent findings, theoretical issues, and research methodologies in the areas of animal learning and biopsychology. Consent of instructor required.

31:350 Seminar in Health and Behavioral Science 0-2 s.h.
Review of recent theoretical issues, experimental findings, and research approaches in the area of health and behavioral science. Consent of instructor required.

31:361 Seminar: Clinical Psychology I arr.
Systematic review of selected topics. May be repeated. Consent of instructor required.

31:380 Ethics and Professional Concerns arr.
Standards and procedures for review of studies with human participants, professional ethics, licensing, teaching of psychology, professional placement.

31:390 Seminar: Homeostasis and Behavior 0-2 s.h.
Interactions of behavior with homeostatic processes; current understanding of biological bases of behaviors involved in the maintenance of homeostasis and the interactions of behavior and physiological processes in situations where homeostasis is disrupted and illness results.

31:461 Introductory Practicum arr.
Psychodiagnostic work in Department of Psychology clinic under supervision of clinical psychology faculty members. Consent of clinical training committee required.

31:462 Assessment Practicum arr.
Supervised practice in psychological assessment techniques. Consent of clinical training committee required.

31:463 Therapy Practicum arr.
Supervised practice and clinical experience in the application and evaluation of psychological therapies. Consent of clinical training committee required.

RELIGION

Director: George W.E. Nickelsburg
Professors: Robert D. Baird, T. Dwight Bozeman, Jay A. Holstein, J. Kenneth Kuntz, James F. McCue, George W.E. Nickelsburg, James C. Spalding
Professors emeriti: David R. Belgum, George W. Forell, Sidney E. Mead, W. Pachow
Associate professors: John P. Boyle, Helen T. Goldstein, David E. Klemm, George W. Paterson
Assistant professors: Raoul Birnbaum, William M. Bodiford, Diana Fritz Cates
Undergraduate degree offered: B.A. in Religion
Graduate degrees offered: M.A., Ph.D. in Religion

Religion is a major factor in human culture, with the power to unify society as well as to disrupt and divide it. Given the diversity of cultures in a shrinking global context, an understanding of religion and its personal and social roles is a significant element in a liberal education appropriate to the 1990s. The School of Religion helps students acquire an appreciative and critical understanding of the history and literature of major religions in the East and West, and insight into the nature and meaning of the religious dimensions of human culture.

The school is not a seminary. Academic in its orientation, the undergraduate major in religion provides a foundation for both advanced academic degree work and study at a theological seminary. The graduate programs are designed for students who expect to teach and do research in religion as an academic discipline.

Undergraduate Program

Each year almost two thousand University students majoring in other subject areas enroll in courses in religion as part of their general education; some students choose religion as a second major to complement their studies in the sciences or in other humanistic disciplines.

Undergraduate students seeking the Bachelor of Arts in religion elect at least 27 semester hours of course work in religion. At least 12 of the 27 semester hours must fall under one of the areas of concentration listed below. A minimum of three courses in the area of concentration must be at the 100 level, and at least 12 of the semester hours must be outside the area of concentration. A minimum of one course outside the area of concentration must be at the 100 level. Students also must fulfill the requirements of the College of Liberal Arts (see the "College of Liberal Arts" section of the *Catalog*).

The areas of concentration are Jewish and Christian scriptures; history of religion and religious thought in the West; Western theology and ethics; and Asian religions.

Honors

The honors major is for students of superior ability who want to pursue individual research. To undertake the honors major in religion, the student must be admitted to the College of Liberal Arts Honors Program by the director of that program and by the director of the honors program in the School of Religion. Application should be made by the beginning of the junior year but may be made earlier.

Minor

A minor in religion requires 15 semester hours of credit in religion courses with a minimum grade-point average of 2.00. Of the 15 semester hours, at least 12 must be taken at The University of Iowa in courses numbered 32:100 and above.

Graduate Programs

The School of Religion prepares a select number of graduate students to become specialists in the study and teaching of religion.

Master of Arts

There are two tracks, thesis and nonthesis, toward the M.A. In both, students must earn a minimum of 36 semester hours in the School of Religion. Most of these hours will be earned in courses that fall into one of five areas of concentration: the Hebrew Bible and its early interpretations; Judaism and Christianity in the Greco-Roman world; history of religion and religious thought in the West; theology and ethics; and history of Asian religions. Students in the thesis program take at least one seminar in this area and may count the thesis for 6 of the semester hours required. Students in the nonthesis program take at least two seminars.

A maximum of 6 semester hours of graduate work in religion may be transferred to the program from another accredited graduate or professional school. The student's committee must approve a program of study, including course work and requirements for languages and other research tools.

All students are required to take a written M.A. examination that tests competence in the area of concentration.

Master of Arts in Religion and Health

Study of the role of religion in illness and health requires a combination of theoretical and clinical investigation. The University of Iowa Hospitals and Clinics provides the setting for research and training in this program.

Students may choose a thesis or nonthesis program. In either, they are required to earn 36 semester hours. Students in the thesis program take one seminar and may count the thesis for 6 semester hours of credit. Students in the nonthesis program take two seminars. A maximum of 6 semester hours may be transferred from another accredited graduate or professional school.

All students must complete a one-semester unit of 32:245 Clinical Study of Religion or present equivalent experience. The program also includes required courses in religion and personality and at least four courses (for a minimum of 10 semester hours) in one other area of concentration in the School of Religion: the Hebrew Bible and its early interpretations, Judaism and Christianity in the Greco-Roman world; history of religion and religious thought in the West; theology and ethics; and history of Asian religions.

The student's advisory committee may require languages or other research tools. All students must take an M.A. examination.

Doctor of Philosophy

The broad-based Ph.D. program places a high priority on the academic study of religion in its broad intellectual and cultural contexts. The program is structured to facilitate development of the research skills necessary to undergird effective teaching and to foster the generation of new knowledge. As teaching assistants, Ph.D. students have maximal opportunity to develop teaching skills.

Candidates for the doctorate must complete a minimum of 72 semester hours of graduate course work, of which 9 semester hours must be taken outside the School of Religion. A maximum of 12 semester hours is allowed for the dissertation.

The graduate areas of concentration are: the Hebrew Bible and its early interpretations; Judaism and Christianity in the Greco-Roman world; history of religion and religious thought in the West; theology and ethics; and history of Asian religions.

No later than the middle of the student's fourth semester of residency, the entire faculty decides whether to grant candidacy to the student, upon the recommendation of the faculty committee of one of the Ph.D. programs. The student must:

take the introductory colloquium designed to orient new graduate students to basic issues in the academic study of religion;

show evidence of the ability to write scholarly papers; judgement is based on a series of papers, one for each completed semester of residency, which the program faculty has previously judged to represent satisfactory progress toward the degree;

have a cumulative grade-point average of at least 3.20;

make satisfactory progress in the language requirements appropriate to his or her program; and

file a plan of study that lists course work and language and research tools in

preparation for the written and oral comprehensive examinations.

Doctoral candidates also must pass an oral examination on the dissertation.

More detailed information on degree requirements and graduate study policies of the School of Religion is provided in *Information for Graduate Students*, a publication that is updated regularly and made available to all new students. Inquiries about any of the programs may be made to the director of the school.

Financial Aid

The School of Religion offers two types of departmental financial aid for graduate students: teaching assistantships and research assistantships. The department also may nominate eligible students for University of Iowa Fellowships.

The Gilmore Scholarship has been established for doctoral students interested in the relationship of religion, the visual arts, and humanistic values.

Financial aid awards are made annually on a competitive basis. First-year students ordinarily are appointed only as research assistants.

Admission

All applicants for admission to graduate study must meet the general requirements of the Graduate College. In addition, the School of Religion ordinarily requires a combined verbal-quantitative score of 1050 on the Graduate Record Examination (GRE) General Test and a 3.00 grade-point average for admission to the M.A. program, and a combined verbal-quantitative score of 1100 on the GRE General Test and a grade-point average of 3.20 for admission to the Ph.D. program. Three letters of recommendation and the submission of a significant writing sample also are required.

Resources

In addition to Greek and Latin and modern European languages, the University offers courses in Japanese, Chinese, Sanskrit, and Hindi. The School of Religion offers Hebrew and other Semitic and Hamitic languages as needed.

The University of Iowa Hospitals and Clinics provides clinical opportunities for students in the M.A. program in religion and health. Individual courses on such topics as death and dying and medical ethics also utilize hospital personnel and facilities.

Courses

32:1 Judeo-Christian Tradition 3 s.h.
Nature of religion and analysis of the Hebrew Bible and Judaism as well as the New Testament and Christianity. GER: historical perspectives.

32:2 Religion and Society 3 s.h.
The meaning and function of religion in traditional and modern social contexts in the West. GER: humanities.

32:3 Quest for Human Destiny 3 s.h.
Explores some quests for destiny in terms of perceived options/goals and the ability to recognize, pursue, and achieve them. GER: humanities.

32:4 Living Religions of the East 3 s.h.
Religious beliefs and practices of peoples of India, China, and Japan. GER: foreign civilization and culture, historical perspectives. Same as 39:64.

32:10 Introduction to Religious Studies 3 s.h.
Introduction to the academic study of religion through examining several levels on which religion has been approached. GER: humanities. Open only to juniors and seniors or to others with consent of instructor.

32:11 Old Testament Survey 2 s.h.
Life and afterlife in biblical Israel.

32:12 Old Testament Survey 2 s.h.
The presence of the biblical God in and among humankind.

32:15 New Testament Survey 3 s.h.
Literature of the New Testament in its historical setting. GER: humanities.

32:20 Religion in American History 2-3 s.h.
Protestant, Catholic, and Jew; colonial era to present. Same as 16A:72.

32:51 Religious Thinkers of the West 3 s.h.
Significant religious thinkers in Western civilization, including Augustine, Bonaventure, Fichte, Kierkegaard, and Heidegger. GER: humanities.

32:61 Islamic Belief and Practice 3 s.h.
An introduction.

32:70 Classics in Religious Ethics 3 s.h.

32:100 Biblical Hebrew I 3 s.h.
Systematic introduction to basic elements of classical Hebrew grammar and syntax.

32:101 Biblical Hebrew II 3 s.h.
Further study of Hebrew grammar and syntax, with increasing attention to acquiring reading skills. Prerequisite: 32:100.

32:103 Biblical Archaeology 1,3 s.h.
Contributions of Syro-Palestinian archaeological research to understanding historical and cultural backgrounds of biblical period.

32:104 Egyptian and Mesopotamian Art 3 s.h.
Same as 1H:110.

32:105 The World of the Old Testament 3 s.h.
Historical and intellectual background of the Old Testament; focus on patterns of thought and religion in Near East and relation to Israelite religion.

32:106 Theology of the Old Testament 3 s.h.
Study of ancient Israel's perspective on God, the world, and the individual through focus on dominant biblical themes.

32:108 Prophecy in Biblical Israel 3 s.h.
Literary, historical, and theological analysis of the prophetic movement in ancient Israel and its effect on the present.

32:110 Biblical Aramaic 3 s.h.
Survey of Aramaic grammar; reading of Aramaic portions of the Old Testament.

32:111 Religion and Women 3 s.h.
Study of sexism and its disavowal in biblical narrative, law, wisdom texts, Gospels, and epistles; contemporary impact. GER: humanities. Same as 131:111.

32:113 Introduction to the Intertestamental Period 3 s.h.
History and theology of Judaism from 200 B.C.E. to 135 C.E.; readings from English translations of sources; archaeological evidence.

32:114 Readings in Intertestamental Jewish Texts 3 s.h.
Reading and interpretation of two or three writings.

32:115 Greek Jewish Literature 3 s.h.
Same as 14:109.

32:116 Introduction to Rabbinic Literature 3 s.h.
Literary genres, historical and cultural context, and problems in interpretation of the rabbinic writings of the first six centuries of this era.

32:118 Medieval Jewish Philosophers 2-3 s.h.
May be offered as a survey of medieval Jewish philosophy or as a study of one specific philosopher.

32:119 Jewish Mysticism 3 s.h.
Survey of the history of Jewish mystical thought over the past 2,000 years.

32:120 The Jewish Experience 3 s.h.
Jewish history and the development of Judaism; beginnings in the Mediterranean basin, and Jews and Judaism from there throughout the world and through the centuries.

32:122 The World of the New Testament 3 s.h.

32:123 Paul 3 s.h.
Aspects of Pauline theology in historical context.

32:124 The Synoptic Gospels 3 s.h.
Interpretation of one of the first three gospels, with reference to the other two.

32:125 The Gospel of John 2-3 s.h.

32:126 Studies in New Testament Theology 2 s.h.
Discussion of selected topics.

32:129 History of Christian Theology I: Patristic Era 3 s.h.
From the end of the New Testament period to the end of the fifth century.

32:130 History of Christian Theology II: Scholasticism and Reformation 3 s.h.
Scholastic theologies; their relation to the theologies of Luther and Calvin and to the Council of Trent.

32:131 History of Christianity to 1500 3 s.h.
History of the Christian Church from its origins through its development in the Mediterranean world and in medieval Europe. GER: historical perspectives.

32:132 History of Christianity 1500-Present 3 s.h.
Protestant and Catholic Christianity in the age of European expansion; enlightenment; nineteenth- and twentieth-century challenges and responses. GER: historical perspectives.

32:133 Problems in History of Christianity 2-3 s.h.
Proseminar focusing on a selected problem in the history of Christianity. May be repeated.

32:135 Religious Thought of Soren Kierkegaard 2 s.h.

32:136 Religious Thought in the Eighteenth Century 3 s.h.
Trends in Western religious thought during the Age of Reason, 1660-1800.

32:137 Religious Thought in the Nineteenth Century 3 s.h.
History and analysis of the main developments in religious thought, 1800-1915.

32:138 Religious Thought in the Twentieth Century 3 s.h.
History and analysis of the main developments in religious thought, 1915-present.

32:139 British Religious Thought in the Nineteenth and Twentieth Centuries 3 s.h.

32:140 Readings: Religion in American History arr.
Same as 16A:120.

32:141 Varieties of American Religion 2-3 s.h.
Survey of distinctive religious groups: Mormon, Christian Scientist, Jehovah's Witness, Black Muslim, Unification Church of Sun Myung Moon. Same as 16A:122.

32:142 Puritanism in Old and New England 2-3 s.h.
Historical survey; analysis of concepts of the sacred book, redemption, the world's end, church and state, the family, women, Indians, sex. Same as 16A:121.

32:143 Religious Thought in America 1607-1860 2-3 s.h.
Religious factor in the life of the mind in America; reference to selected American thinkers. Same as 16A:123.

32:144 Religious Thought in America 1860 to Present 2-3 s.h.
Religious factor in the life of the mind in America; reference to selected American thinkers. Same as 16A:124.

32:145 Religion in American Culture 2-3 s.h.
Same as 16A:119.

32:146 Philosophy of Religion 3 s.h.
Same as 26:134.

32:147 Religion and Literature 2-3 s.h.
Biblical themes, such as innocence and evil, morality and immorality, traced in the works of Melville and Hemingway.

32:148 Literature and Philosophic Thought 2-3 s.h.
The literature of the Holocaust. Same as 8:176.

32:151 Process and Experience: Currents in Anglo-American Theology 2-3 s.h.
The importance of "process" and "experience" for contemporary theology.

32:152 Theological Questions I 3 s.h.
Treatment of basic religious questions, such as the meaning of "God," nature of religious symbols, phenomena of skepticism and atheism.

32:153 Theological Questions II 3 s.h.
Discussion of Christology and its counterparts in non-Christian theologies; emphasis on subjectivity of experience, specifically the dislocation of self.

32:154 Readings from Reformers to Counter-Reformers 3 s.h.
Reformation of the sixteenth century—Lutheran, Calvinist, Radical, and English—with readings from major representatives of each.

32:155 Theology of Luther 2-3 s.h.
Analysis of religious thought of the sixteenth-century reformer.

32:156 The Theology of Paul Tillich 3 s.h.
Exposition and analysis of Tillich's thought.

32:157 Twentieth-Century Catholic Theology 3 s.h.
Principal developments in Catholic theology from 1900 to the present.

32:158 Religious Ethics: Moral Character and Religious Faith 3 s.h.
On the nature of moral character and the impact of religious faith on moral character: character and moral agency; wickedness and self-deception; the moral and religious transformation of self and community in faith.

32:159 Political Theology and Social Existence 2-3 s.h.
Analysis of recent trends and methods in political and liberation theology as it affects social existence and ethics.

32:160 Christian Ideas of Church 2-3 s.h.
Historical survey of Christian ideas of the church; the theme of the church and its relation to society.

32:161 History of Religious Ethics 2-3 s.h.
Christian and Jewish ethics from Paul to Martin Buber; focus on how religious faith affects the moral life.

32:163 Introduction to Biomedical Ethics 2-3 s.h.
Ethical dimensions of modern life sciences, with particular attention to problems of method.

32:164 Religion and the Occult in Antiquity 3 s.h.
Investigation of the place of occult power in the early religions of Greece and Rome; its growth; magical influences on Greco-Roman culture from outside, during the pre-Christian period; the advent of Eastern mystery cults. GER: humanities. Same as 20:113.

32:165 Anthropology of Religion 2-3 s.h.
Religious activity in folk and tribal settings; application of theories of origin and functions of religion in human affairs. Same as 113:142.

32:166 Faith and Reason in Islam 3 s.h.

32:167 Islam in Modern Times 3 s.h.

32:168 Art of Islam 3 s.h.
Islamic architecture, painting, and minor arts in Spain, North Africa, Egypt, Turkey, Syria, Iraq, Iran, Afghanistan, and India, 600-1800 A.D. Same as 1H:113.

32:169 Religion in India 3 s.h.
Movements, doctrines, and religious practices in India, both in history and in modern expressions. GER: foreign civilization and culture. Same as 39:167.

32:170 Indian Devotional Literature in Translation 3 s.h.
Same as 39:137.

32:171 Indian Religious Texts 3 s.h.
Same as 39:163.

32:173 Readings in Sanskrit Texts 3 s.h.
Advanced readings in philosophical and literary texts in the original Sanskrit. May be repeated.

32:174 Art of India I 3 s.h.
To 1000 A.D. Same as 1H:115, 39:181.

32:175 Painting of India 3 s.h.
Same as 1H:118, 39:168.

32:176 Chinese Religions 3 s.h.
Thematic introduction to the study of religion in China; emphasis on major currents and patterns of religious belief and practice; readings from primary sources. GER: foreign civilization and culture. Same as 39:161.

32:177 The Vision Quest 3 s.h.
Forms, contents, and functions of the vision quest—the search for direct personal contact with a deity or spirit, in comparative perspective; emphasis on Native American cultures.

32:178 The Literature of Taoism 3 s.h.
Readings illustrating the pervasive influence of philosophical and religious Taoism in areas of traditional Chinese life such as political theory, poetry and the arts, alchemy and medicine, sexual custom, and combat. Same as 39:140.

32:179 Scripture, Cult, and Practice in Mahāyāna Buddhism 3 s.h.
Key Mahāyāna *sūtras*, the deity cults and imagery inspired by these texts, and associated practice traditions.

32:180 Buddhist Sacred Texts 3 s.h.
Critical study of Mahāyāna and Theravada texts in translation. Same as 39:162.

32:181 Buddhist and Hindu Iconography 2-3 s.h.
Historical development of religious imagery of Buddhism and Hinduism in India, Central and Southeast Asia, China, and Japan. Same as 1H:114.

32:182 Religion in Japan 3 s.h.
Study of main religions in Japan. GER: foreign civilization and culture. Same as 39J:161.

32:183 Readings in Japanese Religious Texts 3 s.h.
Readings in Japanese religious texts in the original Japanese. May be repeated. Consent of instructor required. Same as 39J:170.

32:184 Religious Themes in Japanese Literature 3 s.h.
Religious themes expressed in Japanese literature. Same as 39J:184.

32:185 Asian Buddhist Traditions 3 s.h.
Introduction to Buddhist traditions in India, China, and Japan. Same as 39J:185.

32:187 Themes in Japanese Religion 3 s.h.
Same as 39J:187.

32:188 Zen Buddhism 3 s.h.
Development of Zen Buddhist ideology and ritual practice in the context of East Asian Buddhism and in relation to other meditative cults and shamanistic traditions.

32:190 Religions of the World 3 s.h.

32:192 Religion and Personality 3 s.h.
Psychological interpretations of religious experience and behavior; religious factors in personality development.

32:193 Suffering, Death, and Faith 2-3 s.h.
The role of religion for persons suffering from life-threatening and life-altering illness.

32:195 Individual Study: Undergraduates arr.
May be repeated.

32:196 Senior Majors Seminar 2-3 s.h.
Discussion of selected issues central to an academic study of religion; intended for senior majors.

32:197 Honors Tutorial 2-3 s.h.

32:198 Honors Essay 2-4 s.h.

32:200 Colloquium: Introduction to the Graduate Study of Religion 1 s.h.
Orientation to the graduate study of religion and to the profession of teacher-scholar.

32:201 Proseminar: Biblical Studies 3 s.h.
Biblical and related literature and its contexts; exegetical and historical methods; bibliography and other resources.

32:202 Seminar: Problems in Old Testament Criticism 3 s.h.
Topics vary; includes Pentateuch, Old Testament poetry, prophetic or wisdom literature.

32:203 Seminar: Problems in New Testament Interpretation 2-3 s.h.
Different problems discussed each semester; knowledge of Greek required.

32:205 Jewish Interpretations of the Bible 3 s.h.
Principles, methods, and contents of biblical interpretations in Jewish texts of the Greco-Roman period.

32:207 Semitic and Hamitic Languages arr.
Introductory grammar and syntax of an ancient language such as Aramaic, Syriac, Ethiopic, and Coptic. May be repeated.

32:208 Early Post-Biblical Christian Texts arr.
Study in the original language of noncanonical Christian texts of the Roman and Byzantine periods; attention to linguistic, literary, and theological matters. May be repeated.

32:210 Seminar: Studies in Christian Origins I 3 s.h.
Ministry of Jesus and beginning of the church; variety of Christian beliefs and practices in first century.

32:211 Seminar: Studies in Christian Origins II 3 s.h.
Development of Christianity to late second century; character and relationships of Jewish Christianity, gnosticism, and emerging orthodoxy.

32:212 Seminar: Mediaeval Muslim and Jewish Philosophy arr.
Origins and influence; treatment of selected problems. Same as 16:217.

32:213 Seminar: American Religious Thought arr.
Study of selected thinkers. Same as 16:275.

32:214 Seminar: Puritanism arr.
Same as 16:276.

32:219 Seminar: Nineteenth-Century Catholic Theology 3 s.h.
Study of Catholic reactions to the Enlightenment and French Revolution, the restoration of Scholasticism, Newman, Vatican I.

32:220 Proseminar: Introduction to Systematics 3 s.h.
Introduction to theological thinking, treating such basic questions as the kinds of theological systems, resources, methods, aims, and characters of religious thought.

32:221 Proseminar: Methodology and the History of Religions 3 s.h.
Development of ability to think methodologically; functionalism, phenomenology, personalism, and normative approaches; the nature of category formation and the logic of religio-historical method.

32:222 Seminar in Historical Theology 3 s.h.
Intensive study of a particular problem of theology.

32:223 Seminar: Reformation Theology arr.
Theology of one great Protestant reformer of the sixteenth century.

32:224 Seminar: Contemporary Theology arr.
Intensive study of one of more theologians or theological problems.

32:225 Seminar in Recent Catholic Theology arr.
Study of a contemporary theologian or of a particular problem in present Roman Catholic theology.

32:227 Seminar: Jewish Religious Thought: From Maimonides to Derrida 3 s.h.
Continuity and innovation in Jewish religious thought.

32:228 Sacred Geography 3 s.h.
Religious views and practices related to the landscape, as seen in several distinctly different cultural and ecological settings.

32:229 Topics in Religious Ethics: Feminist Ethics and Theology arr.
Critical and constructive feminist ethical responses to traditional understandings of creation, sin, and salvation.

32:230 Anthropology, History, and the Study of Religion 3 s.h.
Anthropological and historical approaches to the study of

religion; emphasis on close analytical reading of significant works from a wide variety of fields.

32:231 Seminar: Problems in the History of Religions 3 s.h.
Research and reading in methodological and interpretive problems.

32:232 Seminar: Religion in India 3 s.h.
Research and reading on a selected Indian thinker or movement. Same as 39:267.

32:233 Seminar: Buddhism arr.
Research and reading on a selected Buddhist thinker or movement. Same as 39:263.

32:234 Seminar: Japanese Religions arr.
Same as 39J:234.

32:235 Seminar: Chinese Religions 3 s.h.
A theme or issue in Chinese religions.

32:237 Seminar: East Asian Religion in Cross-Cultural Perspective 3 s.h.
A theme or issue; emphasis on China and/or Japan.

32:244 Seminar: Religion and Health arr.

32:245 Clinical Study of Religion arr.
Supervised study in the hospital setting.

32:250 Translation Colloquium: Theological Texts in German I 2 s.h.

32:251 Translation Colloquium: Theological Texts in German II 2 s.h.

32:252 Translation Colloquium: Latin Biblical Texts I 2 s.h.

32:253 Translation Colloquium: Biblical Latin II 2 s.h.

32:254 Translation Colloquium: Theological Latin 2 s.h.

32:260 Readings in Jewish and Christian Scripture arr.
May be repeated.

32:261 Readings in Rabbinic Hebrew arr.
May be repeated.

32:262 Readings in History of Christianity arr.
May be repeated.

32:263 Readings in Theology and Religious Thought arr.
May be repeated.

32:264 Readings in Religious Ethics arr.
May be repeated.

32:265 Readings in Asian Religions arr.
May be repeated.

32:266 Readings in the Methodology and the History of Religions arr.
May be repeated.

32:267 Readings in Religion and Health arr.
May be repeated.

32:290 Individual Study: Graduates arr.
May be repeated.

32:291 Thesis arr.
May be repeated.

RHETORIC

Chair: Dennis Moore
Professors: Margaret B. McDowell, Donovan J. Ochs, Douglas M. Trank
Associate professors: Frederick J. Antczak, Gene H. Krupa, Dennis Moore
Associate professors emeriti: William G. Clark, Richard S. Hootman, Lou Kelly, Lois B. Muehl
Assistant professors: Barbara Biesecker, Ralph Cintron, Cleo Martin, Takis Poulakos, Carol Severino, Mary Trachsel
Visiting instructor: Allison York

The Rhetoric Department offers courses that fulfill the General Education Requirement in rhetoric and provides individual instruction in lab settings. Rhetoric faculty members also advise graduate instructors and teach advanced courses that promote the rhetorical understanding and professional development of graduate students from diverse disciplines.

Rhetoric courses help students to:

- read with understanding and enjoyment, and write and speak about reading with personal authority and analytical skill;
- use writing and speaking to discover and explain, question and defend ideas;
- take into account such fundamental rhetorical concepts as audience, purpose, and appropriateness in devising effective communication. Some rhetoric classes are organized around a special topic, but the emphasis is always on rhetorical practice and analysis.

All undergraduates—including transfer students—must satisfy the rhetoric requirement in one of several ways:

pass 10:1 and 10:2 (total of 8 s.h.);

pass 10:3 (4 s.h.);

score high on the speech exemption test and pass 10:4 (3 s.h.);

score high on the essay exemption test and pass 10:6 (3 s.h.);

score high on both the speech and essay exemption tests; or

some combination of the above, with appropriate course work accepted for transfer credit.

During their first semester at the University, students should enroll in the course indicated on their graduation progress reports or degree audits (unless a delay is required). Students must enroll in rhetoric each semester until the requirement has been satisfied.

Once enrolled in a rhetoric course, a student may not drop.

Placement is ordinarily determined by American College Testing scores and any available transfer credit. Students who question their placement may bring graduation progress reports or degree audits to the Rhetoric Department office, 71 EPB, during registration.

Students registered in 10:1 can test into 10:3 by achieving a high score on a two-part essay examination. Students registered in 10:3, 10:4, or 10:6 can satisfy all or part of the rhetoric General Education Requirement by taking an essay and/or speech examination. No academic credit is awarded for these examinations, which usually are administered on the first two nights of the semester. Further information is published in the *Schedule of Courses* each semester.

Students who have undergone formal evaluation by the Office of Services for Persons with Disabilities and are found to be learning disabled in reading, writing, or speaking may request reasonable accommodations in order to complete the rhetoric requirement. Accommodations may be arranged by the Office of Services for Persons with Disabilities in consultation with the Rhetoric Department.

Satisfactory completion of the rhetoric requirement is prerequisite to the humanities GER course 8G:1 The Interpretation of Literature.

Courses

10:1 Rhetoric 4 s.h.
Instruction and practice in speaking, writing, and critical reading, with focus on exposition and criticism; develops competence in analyzing, organizing, and developing ideas and in adapting discourse to readers and listeners.

10:2 Rhetoric 4 s.h.
Continued instruction and practice in oral and written communication with focus on critical thinking and research; develops competence in research procedures—location and evaluation of information and diverse points of view, analysis and responsible use of evidence, reasoned interpretation of substantive matters; culminates in persuasive essays and speeches informed by research.

10:3 Rhetoric 4 s.h.
Accelerated one-semester version of the 10:1-2 sequence.

10:4 Rhetoric 3 s.h.
Accelerated instruction and practice in writing and reading.

10:6 Principles of Speech Communication 3 s.h.
Accelerated instruction and practice in speaking and reading.

10:8 Rhetoric 2 s.h.
Individual instruction in reading; assignments combine use of Reading Lab materials, textbooks from current University courses, and library resources. Open only to students not enrolled in another rhetoric course. Not an elective. Does not provide credit toward degree.

10:9 Rhetoric 2 s.h.
Instruction focuses on the particular needs and interests of each writer. Open only to students not enrolled in another rhetoric course. Not an elective. Does not provide credit toward degree.

10:89 Rhetoric 4 s.h.
Introduction to college-level writing and reading for students who need intensive work before enrolling in 10:1. Does not provide credit toward degree. Corequisite: registration for two contact hours in the Writing Lab.

RUSSIAN

Chair: Ray J. Parrott, Jr.
Professors: Norman Luxenburg, Ray J. Parrott, Jr., Harry B. Weber
Professor emerita: Helene Scriabine
Associate professors: Vadim Kreyd, Christopher A. Wertz
Assistant professors: Miriam J. Gelfand, Margaret H. Mills
Undergraduate degree offered: B.A. in Russian
Graduate degree offered: M.A. in Russian

The Russian program trains students in both the written and spoken Russian language and in Russian literature. It also provides students with an understanding and appreciation of Russian civilization and culture. A knowledge of Russian is seldom an end in itself, but rather is a complement to some other vocation. Accordingly, the department encourages all of its students to pursue a joint major and to develop their interests in related or complementary fields.

Traditionally at Iowa, many students have combined their study of the Russian language with a double major in economics, global studies, history, journalism and mass communication, or political science. They have been better equipped to gain employment in the Russo-Soviet area, and have enjoyed an enhanced knowledge and understanding of the culture, history, peoples, and politics of the Soviet Union.

Through the University's new Bachelor of Arts degree program in Soviet and East European studies, interested students can now focus their undergraduate training precisely on this region of the world. For more information on this complementary B.A. program, see "Soviet and East European Studies" in this section of the *Catalog*.

With the increasing importance of Russian as a language of science and commerce, many students find that training in the language is an important asset to careers in the natural and physical sciences, engineering, medicine, and business. Students of journalism, library science, and the social and military sciences also have strengthened their career preparation through the study of Russian. Some students major in Russian before going into law, international relations, or another profession; others study Russian as preparation for graduate work in Slavic languages and literatures, comparative literature, English, or other humanistic disciplines.

Russian majors with the B.A. and the required education courses occasionally seek teaching careers in secondary schools (see the relevant teacher-preparation programs in the "College of Education" section of the *Catalog*). A number of governmental agencies annually interview job candidates who have advanced training in Russian; these agencies give preference to applicants who couple strong language proficiency with a well-rounded background in area studies. Students who develop an exceptional facility with the language may pursue careers in literary and technical translation and interpretation.

Undergraduate Program

Students working toward the Bachelor of Arts in Russian must meet the general College of Liberal Arts degree requirements (see the "College of Liberal Arts" section of the *Catalog)* and earn at least 28 semester hours of credit in advanced Russian courses. Required courses are:

41:109 Intensive Conversation	3 s.h.
or	
41:110 Intensive Conversation	3 s.h.
41:111-112 Third-Year Russian I-II	8 s.h.
41:113-114 Fourth-Year Russian I-II	8 s.h.

Three of the following:

41:151 Russian Literature in Translation 1800-1860	3 s.h.
41:152 Russian Literature in Translation 1860-1917	3 s.h.
41:155 Tolstoy and Dostoevsky	3-4 s.h.
41:181 Soviet Literature to 1954	3 s.h.
41:182 Soviet Literature since Stalin	3 s.h.
41:185 Russian Culture	3 s.h.
41:186 Soviet Union Today	3 s.h.
41:191 Russian Civilization	3 s.h.

Students majoring in Russian are urged to choose elective courses in economics, geography, history, or political science. Nearly every avenue of professional training and employment available requires a solid background in Russian area studies. For example, a recent statement on the criteria for U.S. Government employment cites as requisite a "substantive knowledge of the area in history, economics, political science, sociological disciplines, scientific specialties, demography, military-related skills, and in some cases cultural and religious background...in-depth knowledge of literature or linguistics without other substantive background may be viewed as overspecialization in a field of limited practical use."

Minor

A minor in Russian requires 15 semester hours with a minimum grade-point average of 2.00. Of these 15 semester hours, 12 must be take at The University of Iowa. The department recommends that students seeking a minor in Russian focus their preparation on advanced (100-level) courses, such as the sequences 41:109-41:110, 41:111-41:112, or 41:113-41:114. Courses taught exclusively in English do not count toward the minor.

Honors

Russian majors of junior or senior standing with a grade-point average of at least 3.20 both in Russian and overall may enroll in the honors program in Russian. An extensive reading program with discussions, regular reports, and a semester paper constitute each honors work unit of 3 semester hours. Students may take up to 9 semester hours of honors in Russian.

Graduate Program

Offered with or without thesis, the Master of Arts program in Russian offers two major emphases, literary or language study.

The focus in literary studies is on the development of Russian literature, both as a national phenomenon and as a part of European culture. Students are expected to analyze writers' styles, perceive literary techniques, recognize literary influences, and develop the ability for sound criticism of form, content, and language of works in all genres.

Students who elect a language studies emphasis focus on the historical development of Russian and do advanced study of contemporary phonology, morphology, syntax, and stylistics.

Candidates for the master's degree must have completed the equivalent of the undergraduate major in Russian. Deficiencies in previous training may be made up by taking appropriate courses.

Candidates for the master's degree are required to complete a minimum of 30 semester hours of graduate work, with or without thesis. Ideally, the program should include courses in related fields such as comparative literature, history, political science, philosophy, and other languages. Students in the thesis program may earn 4-8 semester hours of credit for thesis preparation. Prior to scheduling the M.A. examination and submitting the thesis (where applicable), candidates must pass a comprehensive Russian language examination; they also must demonstrate a reading knowledge of either French or German.

Financial Aid

Aid is available to graduate students in the form of tuition scholarships, and teaching and research assistantships; it is awarded annually on a competitive basis. Teaching assistantships usually are not awarded to first-year students, although exceptions occasionally are made on the basis of advanced language skills. Applications are considered only from students who have been admitted to the Graduate College. Inquiries should be addressed to the departmental office.

Summer and Study Abroad Programs

The department strongly encourages undergraduate and graduate students to participate in intensive programs of language study, both in the United States and in the Soviet Union. In recent years, more and more students have studied in summer, semester, and academic-year programs at Leningrad State University under the auspices of the Council on International Educational Exchanges, as well as in American Council of Teachers of Russian programs at a variety of Moscow and Leningrad institutes that specialize in teaching Russian as a foreign language. Other students have accelerated and refined their Russian language skills in various intensive summer programs at major American universities, including the program at The University of Iowa.

Inquiries should be directed to the Russian Department office.

Course Work for Nonmajors

The department offers a special, two-semester sequence of courses (41:105-106) designed primarily for students who need to develop a reading proficiency in Russian for research purposes in the

natural, physical, social, and military sciences; the sequence is open to students in the humanities as well. The course 41:107 Readings in the Soviet Press is designed especially for students who wish to develop a reading proficiency geared to the daily and periodical press. A number of other classes are open to all University students and are offered in English. These include survey courses in Russian and Soviet literatures, culture and civilization, and a monograph course on Tolstoy and Dostoevsky.

Special Activities

Russian Circle is a student organization open to both undergraduates and graduates; it meets regularly for informal and planned social and educational activities and provides students with a valuable opportunity to develop conversational skills and to share experiences with other members of the University community. Participation in the Foreign Language House in Hillcrest Residence Hall is encouraged by the staff and serves as a focal point for many Russian Circle functions, including weekly meals with faculty and guest speakers. A number of outstanding students are inducted annually into *Dobro Slovo*, the National Slavic Honor Society, and honored at a commemorative gathering.

The Iowa Critical Languages Program

The Iowa Critical Languages Program prepares students to teach Russian, Chinese, or Japanese in Iowa high schools. Each year two students in each language are admitted to the program, which leads to a bachelor's degree with a major in the language and Iowa certification at the secondary level. Applicants must be U.S. citizens or permanent residents. They may already hold a baccalaureate degree and teaching certification.

Through a grant from the Ford Foundation, participating students receive scholarships for a year of study abroad and two summers of intensive language study in programs recognized for their excellence in foreign language training. Participants in the program are obliged to teach in a cooperating Iowa school district for at least three years after graduation. Additional information is available from the Office of Academic Affairs, 111 Jessup Hall.

Language Media Center

The University's Language Media Center provides facilities for language learning, teaching, and research. Equipment in the lab includes standard and short-wave radios, tape and cassette recorders, record players, soundproof recording rooms, drill rooms, and video facilities. An electronic classroom, a soundproof workroom, and a library of tape, disc, and cassette recordings also are available.

Courses

For Undergraduates and Graduates

41:000 Cooperative Education Internship 0 s.h.

41:1 First-Year Russian I 4 s.h.
GER: foreign language.

41:2 First-Year Russian II 4 s.h.
GER: foreign language. Prerequisite: 41:1 or equivalent.

41:3 Second-Year Russian I 4 s.h.
GER: foreign language. Prerequisite: 41:2 or equivalent.

41:4 Second-Year Russian II 4 s.h.
GER: foreign language. Prerequisite: 41:3 or equivalent.

41:5 Introduction to Conversational Russian 3 s.h.
Not a substitute for 41:109 or 41:110.

41:105 Russian for Reading I 3 s.h.
Emphasis on reading scientific and technical Russian material; for students, especially those majoring in sciences, who need to develop a reading ability for research purposes.

41:106 Russian for Reading II 3 s.h.
Prerequisite: 41:105 or equivalent.

41:107 Readings in the Soviet Press 2 s.h.
Prerequisite: 12 s.h. of language instruction or equivalent.

41:108 Special Readings arr.
May be repeated up to 8 s.h. Prerequisite: 16 s.h. of language instruction.

41:109 Intensive Conversation 3 s.h.
Prerequisite: 41:4 or equivalent.

41:110 Intensive Conversation 3 s.h.
Prerequisite: 41:4 or equivalent.

41:111 Third-Year Russian I 4 s.h.
Prerequisite: 41:4 or equivalent.

41:112 Third-Year Russian II 4 s.h.
Prerequisite: 41:111 or equivalent.

41:113 Fourth-Year Russian I 4 s.h.
Prerequisite: 41:112 or equivalent.

41:114 Fourth-Year Russian II 4 s.h.
Prerequisite: 41:113 or equivalent.

41:115 Advanced Conversation I 3 s.h.
Development of oral and aural proficiency; analysis of conversational and grammatical constructions, idioms, and word formation; conducted in Russian. Prerequisite: 41:113 or equivalent.

41:116 Advanced Conversation II 3 s.h.
Perfection of spoken Russian and aural comprehension; oral reports, topic discussions, use of contemporary Soviet television programs via satellite, translations of literary and media materials. Prerequisite: 41:113 or equivalent.

41:117 Russian Composition I 2 s.h.

41:118 Russian Composition II 2 s.h.

41:120 Teaching Methods 3 s.h.
Overview of theories, methods, procedures, and materials of foreign language instruction; helps secondary school students develop knowledge of a foreign language and culture and proficiency in foreign language skills.

41:151 Russian Literature in Translation 1800-1860 3 s.h.
Conducted in English.

41:152 Russian Literature in Translation 1860-1917 3 s.h.
Conducted in English.

41:155 Tolstoy and Dostoevsky 3-4 s.h.
Conducted in English.

41:181 Soviet Literature to 1954 3 s.h.
Conducted in English.

41:182 Soviet Literature since Stalin 3 s.h.
Conducted in English.

41:185 Russian Culture 3 s.h.
Conducted in English. GER: foreign civilization and culture.

41:186 Soviet Union Today 3 s.h.
Conducted in English.

41:191 Russian Civilization 2-3 s.h.
Conducted in English. GER: foreign civilization and culture.

41:199 Honors arr.
May be repeated up to 9 s.h. Consent of department required.

Primarily for Graduates

41:200 Advanced Russian Workshop 2 s.h.
Review seminar for high school teachers of Russian; conversation, advanced grammar review, lexical refinement.

41:201 Advanced Grammar 3 s.h.

41:203 Russian Morphology 3 s.h.

41:204 Readings in Russian Linguistics 3 s.h.

41:205 Russian Syntax 3 s.h.

41:206 Russian Stylistics 3 s.h.

41:211 Russian Romanticism 3 s.h.

41:212 Modern Russian Literature 1880-1917 3 s.h.

41:215 Russian Poetry 3 s.h.

41:216 Russian Folklore 3 s.h.

41:231 Soviet Literature 3 s.h.

41:244 Problems in Russian Literary Criticism 3 s.h.

41:249 Proseminar: Research Methods 2 s.h.

41:250 Proseminar: Research Methods 2 s.h.

41:261 History of the Russian Language 3 s.h.

41:275 Seminar: Russian Literature 3 s.h.

41:276 Seminar: Russian Linguistics 3 s.h.

41:279 Independent Research arr.

41:280 Spetsseminar 3 s.h.

SCIENCE EDUCATION

Coordinator: John E. Penick
Professors: John E. Penick, James A. Shymansky, Robert E. Yager
Associate professors: George W. Cossman, Darrell G. Phillips, Edward L. Pizzini, Daniel S. Sheldon, John T. Wilson
Undergraduate degree offered: B.S. in Science Education
Graduate degrees offered: M.A.T.; M.S. in Science Education; Ed.S.; Ph.D. in Science Education

Science education is concerned with the interface between science and society. The academic programs in science education include preparation in more than one discipline of science; a consideration of science from a philosophical, historical, and sociological perspective; an introduction to applied science (technology); and an education sequence.

Because science education is transdisciplinary, program planning requires the cooperation and involvement of a variety of University departments and colleges. Most of the formal requirements

are drawn from courses offered in these varied departments.

Undergraduate Programs

The undergraduate program in science education represents a transdisciplinary major in science for students interested in education.

The science education major is not intended to prepare students for advanced study in one area of science. When graduates of the Science Education Program elect to pursue graduate studies in a single area of science, they often must complete additional courses in that discipline after they are admitted to the Graduate College.

All of the emphasis areas in science education have the following characteristics in common:

- Depth in a general area of science, equivalent to three years or six semesters of sequential study;
- Preparation in a second area of science equivalent to two years or four semesters of sequential study;
- Introduction to two other fields of science;
- A specified proficiency in mathematics as a tool of science (more mathematics study is required for the physical science emphases than for the biological ones);
- A view of science from a historical/philosophical/cultural perspective; and
- Experience with the application of scientific knowledge.

Admission to the Major

Candidates for a bachelor's degree in science education must be admitted to the science education teacher education program (TEP). In order to be considered for admission to the TEP, students must have completed a minimum of 30 semester hours of course work with a minimum cumulative grade-point average of 2.50. A limited number of applicants are accepted into the science education TEP, so having a 2.50 grade-point average does not ensure admission. Admission decisions are based on grade-point averages in science courses and other criteria relevant to teaching. Procedures and deadlines for TEP applications are described in the College of Education section of the *Catalog* under "Curriculum and Instruction."

Major Requirements

The major in science education requires a minimum of 56 semester hours earned in selected courses in College of Liberal Arts science departments, science applications courses, and courses in the history, philosophy, and sociology of science. Students may choose from six areas of emphases within the science education major: biology, earth science, chemistry, physics, physical science, and general science.

The requirements for the major for the six emphasis areas are as follows.

Biology Emphasis

At least 25 semester hours must be earned in 100-level courses.

Science

2:1 Introduction to Botany	4 s.h.
37:3 Principles of Animal Biology	5 s.h.
Electives (in botany, microbiology, or zoology, including work in genetics, ecology, and physiology)	14 s.h.
4:13-14 Principles of Chemistry I-II	6 s.h.
4:16 Principles of Chemistry Lab I	2 s.h.
4:121 Organic Chemistry I	3 s.h.
Chemistry electives	5 s.h.
12:5 Introduction to Geology	4 s.h.
or	
Approved geology elective	4 s.h.
29:11 College Physics	4 s.h.
Mathematics course at the level of 22M:11 or 22S:8 or higher	3-4 s.h.

Application of Science

97:103 Societal and Educational Applications of Biological Sciences	3 s.h.
97:102 Societal and Educational Applications of Earth Sciences and Environmental Sciences	3 s.h.
or	
97:105 Societal and Educational Applications of Physical Sciences	3 s.h.

Transfer courses from areas such as engineering, agriculture, and technical schools may be substituted for 97:102 or 97:105 with the adviser's approval.

History/Philosophy/Sociology of Science

97:128 Meaning of Science	2-3 s.h.
97:130 Science in Historical Perspective	2-3 s.h.

Earth Science Emphasis

At least 25 semester hours must be earned in 100-level courses.

Science

12:5 Introduction to Geology	4 s.h.
12:25 Environmental Geology Problems	4 s.h.
12:6 Evolution of the Earth	4 s.h.
12:4 Evolution and the History of Life	4 s.h.
12:41 Mineralogy	4 s.h.
12:109 Geology of Iowa	3 s.h.
29:11 Collge Physics	4 s.h.
29:12 College Physics	4 s.h.
or	
12:180 Solid-Earth Geophysics	3 s.h.
29:61 General Astronomy	4 s.h.
44:101 Climatology	3 s.h.
4:13-14 Principles of Chemistry I-II	6 s.h.
4:16 Principles of Chemistry Lab I	2 s.h.
12:149 Elements of Geochemistry	3 s.h.
Earth science electives	3 s.h.

Application of Science

97:102 Societal and Educational Applications of Earth Sciences and Environmental Sciences	3 s.h.
97:103 Societal and Educational Applications of Biological Sciences	3 s.h.
or	
97:105 Societal and Educational Applications of Physical Sciences	3 s.h.

Transfer courses from applied areas such as engineering, agriculture, and technical schools may be substituted for 97:103 or 97:105 with the adviser's approval.

History/Philosophy/Sociology of Science

97:128 Meaning of Science	2-3 s.h.
97:130 Science in Historical Perspective	2-3 s.h.

Chemistry Emphasis

At least 25 semester hours must be earned in 100-level courses.

Science

4:13-14 Principles of Chemistry I-II	6 s.h.
4:16 Principles of Chemistry Lab I	2 s.h.
4:121 Organic Chemistry I	3 s.h.
4:131 Physical Chemistry I	3 s.h.
4:141 Organic Chemistry Laboratory	3 s.h.
29:11-12 College Physics	8 s.h.
and	
Physics electives	7 s.h.
or	
29:17-19 Introductory Physics I-III	12 s.h.
and	
Physics electives	3 s.h.
22M:35-36 Engineering Calculus I-II	8 s.h.

Application of Science

97:105 Societal and Educational Applications of Physical Sciences	3 s.h.
97:102 Societal and Educational Applications of Earth Sciences and Environmental Sciences	3 s.h.
or	
97:103 Societal and Educational Applications of Biological Sciences	3 s.h.

Transfer courses from applied areas such as engineering, agriculture, and technical schools may be substituted for 97:102 or 97:103 with the adviser's approval.

History/Philosophy/Sociology of Science

97:128 Meaning of Science	2-3 s.h.
97:130 Science in Historical Perspective	2-3 s.h.

Physics Emphasis

At least 25 semester hours must be earned in 100-level courses.

Science

29:11-12 College Physics	8 s.h.
or	

29:17-18 Introductory Physics I-II	8 s.h.
and	
29:19 Introductory Physics III	4 s.h.
Physics electives	12 s.h.
22M:35-36 Engineering Calculus I-II	8 s.h.
4:13-14 Principles of Chemistry I-II	6 s.h.
4:16 Principles of Chemistry Lab I	2 s.h.
4:121 Organic Chemistry I	3 s.h.
4:131 Physical Chemistry I	3 s.h.

Application of Science

97:105 Societal and Educational Applications of Physical Sciences	3 s.h.
97:102 Societal and Educational Application of Earth Sciences and Environmental Sciences	3 s.h.
or	
97:103 Societal and Educational Applications of Biological Sciences	3 s.h.

Transfer courses from applied areas such as engineering, agriculture, and technical schools may be substituted for 97:102 or 97:103.

History/Philosophy/Sociology of Science

97:128 Meaning of Science	2-3 s.h.
97:130 Science in Historical Perspective	2-3 s.h.

Physical Science Emphasis

Science

4:13-14 Principles of Chemistry I-II	6 s.h.
4:16 Principles of Chemistry Lab I	2 s.h.
29:11-12 College Physics	8 s.h.
12:5 Introduction to Geology	4 s.h.
Physics electives	8 s.h.
Chemistry electives	8 s.h.
Additional physical science electives (geology, geography, chemistry, physics)	11 s.h.

Application of Science

97:102 Societal and Educational Applications of Earth Sciences and Environmental Sciences	3 s.h.
97:105 Societal and Educational Applications of Physical Sciences	3 s.h.

History/Philosophy/Sociology of Science

97:128 Meaning of Science	2 s.h.
97:130 Science in Historical Perspective	2 s.h.

General Science Emphasis

Science

4:13-14 Principles of Chemistry I-II	6 s.h.
4:16 Principles of Chemistry Lab I	2 s.h.
4:121 Organic Chemistry I	3 s.h.
29:11 College Physics	4 s.h.
29:12 College Physics	4 s.h.
12:5 Introduction to Geology	4 s.h.
2:1 Introduction to Botany	4 s.h.
37:3 Principles of Animal Biology	5 s.h.
Science electives	13 s.h.

Electives must be chosen so there are at least 21 semester hours in either biology, chemistry, physics, or geology.

Application of Science

Two of the following:

97:102 Societal and Educational Applications of Earth Sciences and Environmental Sciences	3 s.h.
97:103 Societal and Educational Applications of Biological Sciences	3 s.h.
97:105 Societal and Educational Applications of Physical Sciences	3 s.h.

History/Philosophy/Sociology of Science

97:128 Meaning of Science	2 s.h.
97:130 Science in Historical Perspective	2 s.h.

Education Course Work for Teacher Certification

Interested students must apply for the Teacher Education Program in room N310 Lindquist Center.

To qualify for a secondary teaching certificate with endorsement to teach science, students must have a 2.50 grade-point average and must complete all College of Liberal Arts General Education Requirements, the requirements for a science education major, and the following professional education courses:

7P:75 Educational Psychology and Measurement	3 s.h.
7S:151 Science Methods I: Elementary School Seminar and Practicum	2 s.h.
7S:152 Science Methods II: Resources, Research Teaching Strategies, and Curriculum Development for K-12 Science	3 s.h.
7S:153 Science Methods III: Middle/Junior High School (taken with 3 s.h. of 7S:189)	2 s.h.
7S:100 Issues in Education	2 s.h.
7S:189 (Section 64) Elementary School	
Special Subject Area Student Teaching (taken with 7S:152)	3 s.h.
7S:187 (Section 91) Seminar: Curriculum and Student Teaching	3 s.h.
7S:190 (Section 91) Individual Projects in Laboratory Practice	3 s.h.
7S:191 (Section 91) Observation and Laboratory Practice in the Secondary School	3 s.h.
7S:192 (Section 91) Observation and Laboratory Practice in the Secondary School	6 s.h.
7F:180 Human Relations for the Classroom Teacher	3 s.h.

Students who complete 7P:106 are recommended for K-12 certification.

Minors in Science Teaching

Six science added certification endorsements are available for persons with teaching majors in other academic areas: biology, chemistry, physics, general science, earth science, and physical science. All require 33 semester hours of credit.

Students who want to pursue a science teaching minor and to qualify for University of Iowa recommendation for teaching certification should consult a faculty member in science education.

All science teaching minors must take:

7S:151 Science Methods I: Elementary School Seminar and Practicum	2 s.h.
7S:152 Science Methods II: Resources, Research, Teaching Strategies, and Curriculum Development for K-12 Science	3 s.h.
7S:153 Science Methods III: Middle/Junior High School	2 s.h.
7S:189 Elementary Special Subject Student Teaching	3 s.h.
97:128 Meaning of Science	2 s.h.
97:130 Science in Historical Perspective	2 s.h.

In addition, they must take the following basic requirements in their chosen minor area, as follows.

Biology

2:1 Introduction to Botany	4 s.h.
37:3 Principles of Animal Biology	5 s.h.
97:103 Societal and Educational Applications of Biological Sciences	3 s.h.
Biology electives	9 s.h.

Chemistry

4:13-14 Principles of Chemistry I-II	6 s.h.
4:16 Principles of Chemistry Lab I	2 s.h.
97:105 Societal and Educational Applications of Physical Sciences	3 s.h.
Chemistry electives	10 s.h.

Physics

29:11-12 College Physics	8 s.h.
Physics electives	10 s.h.
97:105 Societal and Educational Applications of Physical Sciences	3 s.h.

General Science

2:1 Introduction to Botany	4 s.h.
12:5 Introduction to Geology	4 s.h.
4:13 Principles of Chemistry I	3 s.h.
29:11 College Physics	4 s.h.
Applications elective (97:102 or 97:103 or 97:105)	3 s.h.
Science electives	6 s.h.

Earth Science

12:5 Introduction to Geology	4 s.h.
29:61 General Astronomy	4 s.h.
Geology and astronomy electives	11 s.h.
97:102 Societal and Educational Applications of Earth Sciences and Environmental Sciences	3 s.h.

Physical Science

4:13-14 Principles of Chemistry I-II	6 s.h.
4:16 Principles of Chemistry Lab I	2 s.h.
29:11-12 College Physics	8 s.h.
12:5 Introduction to Geology	4 s.h.
97:102 Societal and Educational Applications of Earth Sciences and Environmental Sciences	3 s.h.
or	
97:105 Societal and Educational Applications of Physical Sciences	3 s.h.

Special Rules

Since the Science Education Program may involve many faculty advisers and several colleges and departments, some special rules and regulations apply to science education students. They include the following.

At least 10 semester hours of graded credit in science must be earned at The University of Iowa.

Transfer students must complete their last 30 semester hours in residence in the College of Liberal Arts at The University of Iowa in order to be eligible for the B.S. degree.

No science core courses numbered 11 or credit from the CLEP Natural Science General Examination may be used toward the major in science education.

Science courses taken in other colleges of the University (e.g., colleges of Engineering and Medicine) will not be accepted in lieu of the required course work for the major unless one of the science departments of the College of Liberal Arts certifies in writing to the Registrar's Office that such a course is equivalent to the one offered in that department.

Courses used for the major may not be taken pass/nonpass; grades from all courses used for the science education major will be used in computing a student's grade-point average in the major both at The University of Iowa and overall.

Since mathematics forms an integral part of so many aspects of modern science, all science education students are urged to complete appropriate advanced courses in both pure and applied mathematics (including statistics and computer science) so that they may be qualified to do graduate work and quantitative research later.

Honors

To graduate with honors, students must maintain a 3.20 grade-point average and complete 97:99 Honors Research Project in addition to other science education requirements.

Iowa-SSTP and the Iowa Science and Humanities Symposium

The Iowa Secondary Student Training Program (Iowa-SSTP) is a special summer program that emphasizes research experience for talented secondary students. Participants register for credit as undergraduate students and are placed in research laboratories in a variety of science areas. Various programs, such as Young Scholars and Minority Apprenticeship Programs, are facets of Iowa-SSTP when funding is obtained.

The statewide Iowa Science and Humanities Symposium sponsored by the U.S. Army Research Office each February involves about 180 students and some 40 teachers. The symposium emphasizes career opportunities in science and related fields by focusing on ongoing science research at The University of Iowa.

Graduate Programs

The Science Education Program offers graduate studies leading to the Master of Arts in Teaching, Master of Science, Educational Specialist, and Doctor of Philosophy.

These programs are described in the "College of Education" section of the *Catalog* under "Secondary Education." The Master of Science with specialization in elementary school science education is described in "Early Childhood and Elementary Education."

Special Programs

The Iowa Chautauqua Program involves 250 participants in four or five workshop groups for teachers grades 4-9. The chautauqua focuses on introductory science/technology/society materials and approaches. Another program is Project STEPS, which helps upper elementary and middle school teachers use and evaluate logical and higher order thinking skills. Project FOCIS is a recently funded NSF program that allows middle school teachers to conduct educational research. Other efforts focus on strategies for teachers who work with gifted and talented students and programs that stimulate international faculty exchanges.

Many Science Education Center activities are funded by NSF, Title II, the Iowa lottery program, and industries such as the Iowa Utility Association. Many teachers involved with in-service programs are attracted to graduate degree programs.

Research

Each faculty member in science education is responsible for one or more areas of research. Major interests of faculty and graduate students include the following.

Studies of effective teaching and learning

Attitudinal and other affective outcomes of instruction

Philosophy and sociology of science

Individualized learning

Computer-assisted learning

Classroom interaction studies

Creativity

Student outcomes/perceptions of learning

Intellectual development related to science teaching and learning

Education in less developed countries

Health education

International Programs

The faculty in science education has collaborated on a number of international research and development projects in countries including Brazil, Italy, Spain, Portugal, Israel, Nigeria, Malaysia, Indonesia, Korea, Australia, Taiwan, South Africa, Mexico, and India. Several faculty exchanges have occurred and numerous cross-national studies have been undertaken.

International students enrich the opportunities for graduate studies at the Science Education Center. Many have enrolled from Indonesia, Korea, Malaysia, Nigeria, Taiwan, and other nations around the world. Relations are maintained and new collaborative efforts are underway each year.

Facilities

The facilities for science education programs at The University of Iowa are exemplary.

The Science Education Center is located in Van Allen Hall near the center of the University campus.

Facilities include the two main offices; faculty, secretarial, and graduate student office space; a self-instructional computer laboratory; a photographic laboratory; instructional classrooms, including space for elementary and secondary school science methods courses, applications-oriented courses; a large seminar room used as an instructional center for the history and philosophy components of science education and secondary teacher education programs; a departmental conference room used for seminars, conferences, meetings, workshops, and in-service work with teachers, supervisors, and administrators; a common area for small-group discussions and individual work; and a lounge.

Courses

The following are special courses offered by the Science Education Program to supplement the undergraduate emphasis areas in science education and to provide science options for elementary and special education majors.

Primarily for Undergraduates

97:00 Cooperative Education Internship **0 s.h.**

97:7 Fundamentals of Science **4 s.h.**
Science topics and laboratory investigations drawn from physical, life, and earth sciences; focus on problem solving and process skills in science.

97:20 Investigations in Science **arr.**
Special projects in science for high-ability secondary school students. May be repeated.

97:99 Honors Research Project **arr.**
Research experience required of undergraduates pursuing honors degree.

For Undergraduates and Graduates

97:102 Societal and Educational Applications of Earth Sciences and Environmental Sciences arr.
Review of major ideas and principles of the earth and environmental sciences, emphasizing common applications in today's world.

97:103 Societal and Educational Applications of Biological Sciences arr.
Review of basic conceptual themes of biology, and how they have been derived; emphasis on a current social issue related to biology.

97:105 Societal and Educational Applications of Physical Sciences arr.
Review of the major ideas of physics and how they have been derived; emphasis on how such ideas affect modern society.

97:106 Societal and Educational Applications of Chemical Concepts arr.
Application of the principles of chemistry in industry, communication, and daily living; activities selected to illustrate the utility of the science of chemistry.

97:115 Introduction to Museology 2 s.h.
Same as 24:112, 104:112, 7S:112, 113:103.

97:119 Directed Study arr.

97:128 Meaning of Science 2-3 s.h.
Critical examination of the scientific enterprise from social, ethical, cultural, epistemological viewpoints.

97:130 Science in Historical Perspective 2-3 s.h.
Science and its related contemporary social issues, from the perspective of historical development.

97:140 Problems in Integrating the Teaching of Environmental Science 3 s.h.
Environmental education resources in the community—human, governmental, and natural; integrated (holistic) view of environmental education of K-12 teaching.

SOCIAL STUDIES EDUCATION

Chair: Robert M. Fitch
Professor: Robert M. Fitch
Undergraduate degree offered: B.A. in Social Studies
Graduate degrees offered: M.A. in Social Studies, Ph.D. (in Education)

Undergraduate Program

The major in social studies education is an interdisciplinary, nonprofessional major. It provides an excellent foundation for careers in law, social work, religion, urban planning and development, and government service at all levels.

General Program

Major requirements for the B.A. degree in social studies education total 60 semester hours of credit earned in departments cooperating in the social studies education program. Distribution of the course work is as follows: 12 semester hours in either U.S. or world history; 12 semester hours each in economics, political science, and sociology; at least 3 semester hours in geography; and 9 semester hours in geography, anthropology, U.S. history, or world history.

There is no separate honors program in social studies education. Students who qualify for the College of Liberal Arts Honors Program are encouraged to do honors work in the social science department in which they wish to concentrate their work.

A global studies certificate may be obtained in conjunction with the social studies major. See "Global Studies" section of the *Catalog*.

Teacher Certification Program

Students who want to obtain a teaching certificate in history or other social science areas must declare a major in the academic field they want to teach and earn a total of 30 semester hours in that field. They also must complete 15 semester hours in each of two fields related to history or social science. Majors and related fields may be selected from the following: U.S. history, non-U.S. (world) history, anthropology, economics, sociology, geography, political science, or psychology. Courses must conform to departmental requirements for the major. In most instances, students are assigned an adviser in their major area as well as in social studies education.

Additional information on social studies teacher certification programs is available from the office of the Division of Secondary Education, N293 Lindquist Center.

Graduate Programs

Master of Arts

The department offers the Master of Arts with or without thesis.

Some graduates of this program are classroom teachers and chairs of social studies departments in junior and senior high schools. Some serve as curriculum consultants for school districts, while others are staff members in community colleges. A few have found the degree to be excellent preparation for professional work in correctional and penal institutions. For a few, the master's program in social studies education has provided access to civil service positions at various levels of government.

Students choose from two programs in social studies education. Program A provides an opportunity for interdisciplinary work in history, social science, or related areas for classroom teachers and others interested in acquiring greater competence in their subject area. Program B is for individuals who have their bachelor's degree in history or one of the other social sciences and who wish to obtain a teaching certificate in the process of completing the master's degree. Both programs are described in the "College of Education" section of the *Catalog* under "Curriculum and Instruction."

Doctor of Philosophy

Some graduates of the social studies education doctoral program hold administrative posts in institutions of higher education, serving as presidents, provosts, or deans of faculty or graduate studies. Some are department chairs in colleges of education or curriculum directors in large school districts. Many are in teacher education programs in colleges and universities, while others are college instructors in their areas of academic concentration.

Requirements and admission criteria for the Ph.D. program in Social Studies Education are described in the "College of Education" section of the *Catalog* under "Curriculum and Instruction."

Facilities

Students in social studies education have access to the faculties and facilities of the cooperating departments and the College of Education. Special agencies and services also are available, such as the University Hospital School, the Iowa Center for Education in Politics, the Bureau of Educational Research, the Institute of Public Affairs, the Iowa Educational Information Center, the Curriculum Laboratory, the Statistical Consulting Center, the computer laboratory, and the Weeg Computing Center.

Faculty members who serve as social studies education advisers and coordinators are experienced classroom teachers whose advanced degrees have been earned in history, the social sciences, and education. They are active in professional organizations, consultative work, and in working with schools in curriculum revision.

Courses

98:201 Individual Instruction in Social Studies Education 1-2 s.h.
Individualized readings, field studies, and individual projects; focus on history and social sciences or on problems of professional education. May be repeated. Consent of instructor required.

98:202 Seminar: Social Studies Education arr.
Reading and discussion of significant developments in history, social sciences, and social studies education; substantial investigative paper required. Consent of instructor required. Same as 7S:277.

SOCIAL WORK

Director: Catherine F. Alter
Professors: H. Wayne Johnson, Thomas H. Walz
Professors emeriti: Ralph E. Anderson, Frank Z. Glick, Mildred Snider
Adjunct professors: Woodrow W. Morris, Beverlee C. Tracy
Associate professors: Paul L. Adams, Catherine F. Alter, John L. Craft, John F. Else, Patricia L. Kelley, Kristine E. Nelson, William M. Theisen, Martin B. Tracy
Associate professors emeriti: W. Stanley Good, Katherine A. Kruse
Adjunct associate professors: Marilee Fredericks, Verne Kelley, Janet Laube, Craig

Mosher, Charles M. Palmer, Janie Rhyne, Howard J. Ruppel, Jr.
Assistant professors: B. Eleanor Anstey, Theora Evans-Dodd, Victor Groze, Judith Rinehart, Edward J. Saunders
Assistant professors emeritae: A. Louise Mays, E. Jean Williams
Adjunct assistant professors: James Cone, Wendy Deutelbaum, Diane Dornburg, Robert A. Jackson, Kathy Lambakis, Paul Lambakis, Miriam Landsman, Linda Neuman, Robert Oberbillig, Karen Olmstead, Anita Richards, Rebecca Scavo, Dorothy Seyfried, Bonnie Theisen, Nicholas Tormey, Patricia Tracy, Steve Trefz, Nancy Wallace, Bonnie Williams
Adjunct instructors in social work practicum: Larry Allen, Ronda Armstrong, Glenn Baughman, Diane Baumbach, Loretta Benz, Robert Bloomberg, Barbara Boatwright, Margaret Brass, Larry Brubaker, Susan Buckley, Jay Joseph Cayner, Jerry Christensen, Ellen Cloyed, Pat Conley, Patricia Davis, David Deopere, Sandra Duncan, Ann Dunnigan, Robert Freeman, Richard Frohm, Betty Grandquist, Dan M. Grinstead, Lenore Hale, Lois Hand, Roy Harley, Linda Hart, Ruth Holliday, Mary Hubbard, Glenda Hutton, Loren Jansa, Greg Jensen, Michael Juvenal, Doris Konkel, Robert Koupal, Elizabeth Kudsk, Walter Kurth, Ronald C. Larson, E. JoAnn Laures, Susan Lentzkow, John Leverington, Jean Mann, John McBride, William McCarty, Eileen McGovern, Mary Nagle, Michael O'Melia, Margaret Penney, Philip A. Piechowski, Richard Ponzer, Diane Rattner, Donna Reed, Wilma Richards, Barbara Ruppel, David Rust, Teri Schafer-Nelson, Hilda Sickels, Teri Sisk, Susan Tesdahl, Dennis Timmerman, Margaret Tinsman, Michael Townsend, Joan VandenBerg, Bob Vander Beer, Duane Weiland, Theodore J. Wernimont, Jeanne White, Diane Worick, Dan Wulff, Alan Zabach
Undergraduate degree offered: B.A. in Social Work
Graduate degree offered: M.S.W.

The School of Social Work provides an accredited program of professional training at the baccalaureate and master's levels in physical and social milieu that supports a people-centered approach to professional education.

Undergraduate Program

The Bachelor of Arts program prepares students for beginning professional social work practice. The goals of the program are to prepare students for employment in social services using B.A. graduates, such as public welfare, child welfare, group services, health, mental health, elderly services, and corrections; to provide a base for graduate study in social work or allied professions; and to prepare students for informed community participation in social welfare issues.

The program is accredited by the Council on Social Work Education.

Undergraduate students majoring in social work must satisfy the College of Liberal Arts General Education Requirements. The General Education Requirement in natural sciences should include 11:21 Human Biology. The minimum requirements for a B.A. in social work include 34 semester hours in social work courses, 12 semester hours in one other department (see "Other Courses," below), and 12 semester hours in social science courses. The following courses are required for the major.

Freshman/Sophomore Years

30:1 Introduction to American Politics	3 s.h.
31:1 Elementary Psychology	3-4 s.h.
or	
31:3 General Psychology	4 s.h.
34:1 Introduction to Sociology: Principles	3 s.h.
Any basic economics course	3-4 s.h.
42:022 Introduction to Social Work	4 s.h.

Junior Year

42:147 Racism and Discrimination	3 s.h.
or	
Approved course from another department (see School of Social Work for list)	
42:140 Human Behavior in the Social Environment	4 s.h.
42:141 Fundamentals of Social Work Practice	3 s.h.
42:142 Interpersonal Skills Laboratory	1 s.h.
42:144 Social Work Research	4 s.h.
42:171 Social Work Processes	3 s.h.

Senior Year

42:143 Social Welfare Policy and Practice	3 s.h.
42:189 Field Experience Seminar	1 s.h.
42:193 Field Experience	8-11 s.h.

Other Courses

The undergraduate program requires a minimum of 12 semester hours of course work in one department listed below. Most students select either sociology or psychology. Courses used to meet general education and foreign language requirements do not count toward the 12 semester hours, nor do the specifically required social science courses.

American studies
Anthropology
Business
Communication studies
Economics
Education
English
History
Home economics
Journalism
Leisure studies
Political science
Psychology
Religion
Sociology
Spanish

Honors

The School of Social Work has an honors program leading to a Bachelor of Arts with honors in social work. A 3.20 cumulative grade-point average is required for participation in the program, which enables students to do in-depth study in subjects of interest to them.

Minor

A minor in social work requires a minimum of 15 semester hours of credit in social work courses with a minimum grade-point average of 2.00. At least 12 semester hours must be taken at The University of Iowa in courses numbered 42:100 and above. 42:22, or its equivalent at another institution, is a prerequisite to many upper-level social work courses.

Admission

A limited number of students are admitted to the major. Applications are processed each January. Admission to the undergraduate program in social work requires:

Completion of 42:22 Introduction to Social Work with a grade of C or higher (can be taken the sophomore year);

A cumulative grade-point average of at least 2.50; and

Completion of the application process.

Exceptions may be made for persons who do not meet the grade-point average requirement if they are strong candidates on the basis of other criteria.

More information is available from the coordinator of admissions at the School of Social Work.

Graduate Program

The Master of Social Work program prepares social workers for leadership in the profession and for advanced social work practice in one of two concentrations. The program's general focus is on family systems and social change, both domestic and international. Its common goals, to be met through a set of foundation requirements, are to enable all students to understand the dynamics of human development and change; to learn how to enhance the responsiveness of human service between society and the individual; and to acquire intervention skills for working with individuals, families, small groups, organizations, and communities in public and private agencies and institutions.

The program is accredited by the Council on Social Work Education (CSWE).

The Master of Social Work degree includes 25 semester hours of foundation-level courses and 35 semester hours of advanced-level courses. Students who have a B.S.W. from a CSWE program receive 15 semester hours of advanced standing and earn the degree with 45 semester hours. A limited number of students are admitted to a 36-hour, full-time program. All students must earn 36 hours after admission to the M.S.W. program.

Up to 14 semester hours of partial advanced standing is possible for students who have completed courses in a CSWE-accredited program but who do not have the degree. Students with equivalent foundation course content taken in

departments or programs other than accredited social work programs must pass a qualifying exam for the particular foundation course in order to receive partial advanced standing. Nine to twelve semester hours of graduate transfer credit is allowed for previous graduate work.

The school operates a year-round, sequenced program that begins in the fall semester for full-time students who need the full 60 semester hours. The program continues through the summer, which is a full semester. Full-time students who complete the entire 60 semester hours after admission generally earn the M.S.W. the spring semester of their second year. Those who require 45 semester hours enter the program in the second semester (January). Students in the 36-semester-hour program begin their course work in the third semester (May). The 36-semester-hour program is available only for full-time students.

Part-time students go through the program at a slower pace. Students who need the full 60 semester hours complete the program in four years.

A special intensive summer program has been designed to enable students from Des Moines and the Quad Cities to attend classes in Iowa City.

Students must maintain at least a 3.00 cumulative grade-point average; must be approved for M.S.W. candidacy; and must successfully complete a master's comprehensive examination, an integrative paper involving evaluation of practice, prepared in conjunction with a practicum seminar in the final semester. Students may elect a thesis option for credit and use the oral defense as their final examination.

The following is an outline of the full-time 60-semester-hour program.

First-Year Foundation

Fall Semester

Human Behavior in the Social Environment	4 s.h.
Fundamentals of Social Work Practice	3 s.h.
Interpersonal Skills Laboratory	1 s.h.
Social Welfare Policy and Practice	3 s.h.
Microcomputer Skills Laboratory	1 s.h.
Elective	3 s.h.
Total	12 s.h.

Spring Semester

Social Work Research	3 s.h.
Organization and Community Practice	3 s.h.
Racism and Discrimination	3 s.h.
Foundation Practicum	3 s.h.
Foundation Practicum Seminar	1 s.h.
Elective	2 s.h.
Total	13 s.h.

Summer Session

Electives—including preplacement field practice courses	4-11 s.h.

Second-Year Concentration

Fall Semester

Family Systems Theories or Interdisciplinary Systems Theories	3 s.h.
Advanced Research	3 s.h.
Advanced Practicum in Family Systems or Advanced Practicum in Interdisciplinary Systems	5-6 s.h.
Advanced Practicum Seminar in Family Systems I or Advanced Practicum Seminar in Interdisciplinary Systems I	1 s.h.
Total	12-13 s.h.

Spring Semester

Family Therapy or Social Work Practice in Interdisciplinary Setting	3 s.h.
Family Policy: Domestic and International or Social Policy and Interdisciplinary Systems: Domestic and International	3 s.h.
Advanced Practicum in Family Systems or Advanced Practicum in Interdisciplinary Systems	5-6 s.h.
Advanced Practicum Seminar in Family Systems II or Advanced Practicum Seminar in Interdisciplinary Systems II	1 s.h.
Thesis or elective	2-3 s.h.
Total	12-13 s.h.

Concentrations

After admission, students choose between two concentrations: family systems or interdisciplinary systems. The family systems concentration is designed to help students develop practice competence as enablers of family development and change and as broker/advocates for individuals and families, both traditional and nontraditional. Historically, social work practice has been agency-based; this concentration prepares students to act as change agents in direct practice in public and private social service agencies. Its holistic perspective develops awareness of the interrelationship between families and the social, political, and economic environments in which they live. Consideration is given to the biological, psychological, cultural, and social origins of behavior.

The interdisciplinary systems concentration is designed for students preparing for social work in settings such as public social services, hospitals, schools, clinics, businesses, industry, and corrections. It provides a balance of content for both clinical and nonclinical practice interventions. Students develop skills needed in complex settings, such as working with interdisciplinary assessment and treatment teams, case and unit management, and collaborations with other professionals.

Interdisciplinary systems courses stress the importance of integrating services for multiple-problem individuals and families at the community level. The concentration builds skill in advocacy, interorganizational program coordination and management, conflict resolution, and the application of professional ethics. Students may emphasize direct practice, supervision and organizational development, or community development.

Off-Campus Centers

The full-time program is available in Iowa City and Des Moines. At the end of the first calendar year, some students stay in the Iowa City-Cedar Rapids area for the remainder of their program, including practicum, and some are assigned to Des Moines or the Quad Cities for practicum. Students may need to relocate.

The Des Moines Center, 115 miles west of Iowa City, is located in Iowa's state capital and largest city, Des Moines. The Quad Cities Center is located on the Mississippi River in Davenport, 60 miles east of Iowa City. Full-time students who have a practicum assignment in the Quad Cities usually commute to Iowa City for required courses during the second year of the program. Some elective courses are available in the Quad Cities.

Part-Time Program

The School of Social Work also has a part-time program in three locations: Iowa City, Des Moines, and the Quad Cities. In Iowa City and Des Moines, students are admitted each fall semester. In the Quad Cities, a group of part-time students is admitted every three years; the next group will start in August 1991. Regular School of Social Work faculty members teach required courses in all centers and are available for student advising.

The off-campus programs have been evaluated by CSWE and The University of Iowa Graduate Council as providing a comparable program to that available on the Iowa City campus.

Part-time students complete two courses each spring and fall semester for three or four years. Electives may be taken concurrent with fall and spring semester courses and in the summer. A full range of summer courses is available in Iowa City, and some courses are available in Des Moines. The format for some Iowa City summer courses is intensive, short-term, and split session, enabling students from other centers to take campus courses.

Joint Degree Programs

The school has formal agreements with the College of Law and the Department of Urban and Regional Planning for joint degrees. Students must be accepted to each

department through its regular admission process. Up to nine semester hours in each program are applied to requirements of the other, thus reducing the time it would usually take to pursue two degrees. Individual arrangements may be made with other departments. Students have pursued joint degrees with the College of Business Administration, College of Education, American Studies Program, School of Religion, School of Journalism and Mass Communication, and others. Students are encouraged to take courses in other departments whether or not they are pursuing joint degrees.

Cooperative Programs

In cooperation with the Counselor Education Program in the College of Education, a curriculum has been designed around the requirements of the American Association of Marriage and Family Therapists (AAMFT). Graduates of accredited M.S.W. programs are eligible for associate membership upon fulfilling certain curriculum requirements at the graduate level. Courses are not automatically accepted; graduates need to demonstrate that they meet requirements, usually by sending course outlines.

The School of Social Work participates in the Aging Studies Certificate Program through the College of Liberal Arts. Students can earn the certificate concurrent with the M.S.W. program; they must apply independently to the coordinator of the Aging Studies Program.

The school also participates with the College of Education to provide curricula that meets requirements for school social work certification in Iowa. Students can work toward certification concurrent with the M.S.W. program. Students apply for certification to the assistant to the dean in the College of Education.

Special Projects, Travel/Study Seminars

Students may become involved in special projects such as the National Resource Center on Family-Based Services and the School of Social Work gerontology programs.

The school also offers students the opportunity to participate in travel/study seminars. Urban, rural, national, and international seminars are available.

Graduate Admission

The criteria for admission for full-time and part-time study in the 60- and 45-semester-hour M.S.W. programs are:

- A bachelor's degree from an accredited college or university, with a reasonable distribution of courses in the social sciences and humanities;
- A 3.00 or higher grade-point average for the junior and senior years of undergraduate study, or for 12 semester hours of letter-graded graduate course work (exceptions noted below);
- Three positive letters of recommendation, including one regarding academic abilities and one or more regarding social service or other work experience; and
- A personal statement addressing criteria specified by the School of Social Work.

Previous experience in the human services (volunteer, field, or employment) is desired. Previous enriching life experience (cross-cultural and international experience and background, and minority status) also are granted consideration.

Foreign applicants must score at least 600 on the Test of English as a Foreign Language (TOEFL).

It is the school's policy to admit 10-25 percent of the M.S.W. class with grade-point averages below 3.00. Applicants who are especially strong candidates on the basis of other criteria may be admitted. Since the school seeks to maintain a heterogeneous student body, it makes special efforts to admit students who represent a diversity of racial, ethnic, and socioeconomic backgrounds. Students with developmental disabilities also are encouraged to apply.

Applications are accepted beginning September 1 and must be completed by February 1 to be considered for the next academic year. Students in the 45-semester-hour program begin in January and are considered part of the same class and must meet the same application deadlines as students who begin the preceding semester. Applications for the 36-semester-hour program must be completed by January 1. Additional criteria for admission to the full-time, 36-semester-hour program include:

- A bachelor's degree from a CSWE-accredited social work program;
- A 3.00 or higher grade-point average for the junior and senior years of undergraduate study;
- A minimum of two years of full-time experience after receipt of a bachelor's degree; and
- Completion of a basic statistics course and proficiency in the use of microcomputers (credits received in these two areas are not applied toward the M.S.W. degree).

A complete statement of graduate admission policies is available upon request.

Continuing Education

Nondegree students may enroll for selected courses and workshops through the Saturday and Evening Class Program in Iowa City and the School of Social Work centers in Des Moines and the Quad Cities. There are limits on the graduate course work that may be applied to the master's degree requirements for students who later enroll in the program.

Financial Aid

Financial aid for students varies from year to year. All students seeking financial assistance should apply for aid through The University of Iowa Office of Student Financial Aid and should maintain close contact with the school's financial aid administrator regarding availability of funds from the School of Social Work. Aid received through the Office of Student Financial Aid does not preclude students from consideration for aid through the School of Social Work.

Various types of aid administered by the School of Social Work include research and teaching assistantships, work-study appointments, traineeships, and the Eleanor K. Taylor loan funds. Aid is available from other sources, such as the Graduate and Professional Opportunities Program (GPOP), tuition grants, International Scholarship Awards, the South African Scholarship Program, and a few agencies that provide stipends for graduate students in practicum.

Courses

Most courses are not available every semester.

Primarily for Undergraduates

42:22 Introduction to Social Work **4 s.h.**
Social welfare as a social institution; settings and methodologies of social work practice; profession of social work; historical development of American social welfare and social work; includes a minimum of 45 hours volunteer work. Open only to sophomores or above, or to others with consent of instructor. Same as 34:22.

42:129 Substance Use and Abuse **2 s.h.**
Introduction to chemical dependency for helping professions; etiological, physiological, psychological, legal, and sociological aspects; treatment methods. Open only to juniors or above, or to others with consent of instructor.

42:171 Social Work Processes **3 s.h.**
Practice strategies for working with communities, small groups, families, and individuals within community and organizational contexts; includes 40 hours of required volunteer experience. Prerequisite: 42:141 or consent of instructor.

42:189 Field Experience Seminar **1 s.h.**
Provides opportunity for sharing experiences from a variety of placements; facilitates the integration of learning from prior courses with 42:193. Corequisite: 42:193.

42:191 Individual Study **arr.**
Project related to student's interest carried out under direction of faculty member; sometimes includes group participation. May be repeated.

42:192 Honors in Social Work **arr.**
Supervised individual research. May be repeated. Open only to students admitted to honors program.

42:193 Field Experience **arr.**
Supervised experience in selected social welfare organizations; understanding and use of knowledge and skill common in generalist practice; evaluation of practice; requires 450 hours in agency participation for 8 semester hours credit; may be taken for up to 11 semester hours. Open only to majors with senior standing or to others with consent of instructor. Prerequisites: 42:22, 42:140, 42:141, 42:142, and 42:171; or consent of instructor. Corequisite: 42:189.

For Undergraduates and Graduates

*Courses with numbers preceded by asterisks meet requirements of the M.S.W. program.

42:000 Cooperative Education Internship **0 s.h.**
Corequisite: 42:193 or 42:290 or 42:292 or 42:295 or 42:296.

42:111 Intercultural Communications **3 s.h.**
Same as 36C:111.

42:112 Human Sexuality **1-3 s.h.**
Physiological and psychological aspects of human sexuality; parameters defined by students and instructor. Same as 17:117, 96:112, 7C:112.

42:117 Interdisciplinary Programs for Disabled **3 s.h.**
Same as 7U:117.

***42:140 Human Behavior in the Social Environment** **4 s.h.**
Foundation knowledge of human behavior and development in the context of social and ecological systems; overview of social systemic theories, personality and life span development theories, and theories of psychosocial dysfunction. Open only to social work program students. Prerequisite: 42:22 or graduate standing or consent of instructor.

***42:141 Fundamentals of Social Work Practice** **3 s.h.**
Professional social work practice: functions, roles, skills, conceptual frameworks, values, ethics; focus on integrated approach to practice, including assessment, intervention, evaluation of interventions, termination with individuals, families, and groups; emphasis on empirically based practice. Open only to social work program students. Prerequisite: 42:22 or graduate standing. Corequisite: 42:140.

***42:142 Interpersonal Skills Laboratory** **1 s.h.**
Intensive weekend small-group workshop: practice of interpersonal skills required in the helping relationship. Open only to social work program students. Prerequisites: 42:22 and 42:140, or graduate standing; or consent of instructor. Corequisite: 42:141.

***42:143 Social Welfare Policy and Practice** **3 s.h.**
Framework for analyzing specific social welfare programs, policies, and alternatives; special attention to the impact of social welfare programs on women and minorities; strong international focus. Open only to social work program graduate students or to others with consent of instructor. Prerequisites: an economics course, 42:22 and 42:140; or consent of instructor.

***42:144 Social Work Research** **3-4 s.h.**
Selected research skills appropriate to evaluation of practice and participation in social work research; emphasis on formulating research questions; research design and methodology; sampling techniques; sanctions; data collection; coding and computerized statistical analyses; presentation of findings. Open only to social work program students. Prerequisite: 42:22 or graduate standing or consent of instructor.

***42:147 Racism and Discrimination** **3 s.h.**
Theoretical and historical perspectives on racism, sexism, and other forms of discrimination; application to social work practice with antidiscrimination strategies.

42:183 Issues in Criminal Justice and Corrections **2 s.h.**
Analysis of contemporary programs, organizational structures, and administrative processes in criminal justice, particularly corrections, and related social policy issues; content may vary from term to term. Open only to juniors or above. May be repeated.

42:184 Multidisciplinary Perspectives on Aging **3 s.h.**
Social, behavioral, and health-related perspectives on aging; public and private, traditional and innovative programs for meeting the service needs of the elderly; functional assessment of older persons.

42:185 Social Policy and the Elderly **3 s.h.**
Existing public social policies as they affect the well-being of the elderly, including women and minorities; compares U.S. policies with those of other nations. Junior status or higher required. Prerequisites: 42:143 and an introductory course on aging (17:108, 34:130, 42:184, 96:129), or consent of instructor.

42:186 Comparative Social Policy **3 s.h.**
Comparison of U.S. social policies and programs with those of other countries; historical development and current status of income maintenance, health, education, and social service programs. Junior status or higher required.

42:190 Field Work in Gerontology **arr.**
Opportunities for students in various disciplines to relate their areas of study to the elderly and aging; interdisciplinary relationships and approaches to meeting the needs of the elderly. Prerequisite: 17:108 or 34:130 or 42:184 or 96:129 or consent of instructor.

42:194 Social Work Practice in Health Care Settings **2 s.h.**
Introduction to organization and provision of social work services in health care settings; practice issues such as models of intervention, ethical questions, and the impact of cultural diversity on health care. Prerequisite: 42:141 or consent of instructor.

42:195 Selected Topics **1-2 s.h.**
Special topics in areas of ongoing faculty research.

42:196 Family Violence **3 s.h.**
Child abuse and neglect, domestic violence, and elder abuse; causes, policy aspects, identification, reporting, treatment, and prevention.

42:197 Extramural Seminar **1 s.h.**
Conferences not exclusively sponsored by the School of Social Work in which content is relevant to social work/social welfare; requires conference attendance and participation and meetings with school faculty. Consent of instructor required.

42:198 Social Work Practice with Developmentally Disabled **2 s.h.**
Problems and programming needs of the disabled and their families; review of practice issues, including individual needs assessment and program planning, family dynamics, and service needs.

42:199 Selected Aspects of Social Work and Social Welfare **arr.**
Topics in human behavior, practice, and social welfare policy that are not covered by another course. Consent of instructor required.

Primarily for Graduates

***42:145 Organization and Community Practice** **3 s.h.**
Models underlying theories of organization and community practice; principles of macro social work and skill development in relationship building, needs assessment, decision making, planning, implementing, ethics, and program and self-evaluation. Admission to social work program or consent of instructor required.

42:146 Microcomputer Laboratory **1 s.h.**
Use of microcomputers in social work practice; skill development in use of hardware and software for a variety of applications in social service settings. Open only to social work program students.

42:204 Human Services Administration **2 s.h.**
Effects of organizational structures/processes on individual performance; models of management, communication patterns, and leadership styles; skill development in technical writing, decision making, personnel and financial management, and applied professional ethics. Prerequisite: completion of foundation courses or consent of instructor

42:216 Group Leadership in Human Sexuality **0-3 s.h.**
Introduction to the principles of group dynamics and group process; leadership skills for small, task-oriented discussion groups on human sexuality. May be repeated. Prerequisite: 42:112 or consent of instructor(s). Same as 7C:216, 96:216.

42:220 Family Law **3 s.h.**
Legal systems, rights, and processes related to families; marriage, divorce, custody, protective services, reproductive rights, adoption, commitment, delinquency, education, poverty, and discrimination; roles of lawyers and social workers in the legal system. Prerequisite: 42:143 or consent of instructor.

42:222 Social Policy Issues in Health Care **3 s.h.**
Use of a policy model to analyze major health policy issues in the United States; health care systems; socioeconomic-political contexts; tendencies, strategies, and prospects for change; significance to the social work profession. Prerequisite: 42:143 or consent of instructor.

42:223 Cross-Cultural Social Work **2-3 s.h.**
Theories and issues of social work practice with culturally different populations, including U.S. ethnic groups, women, homosexuals, differently abled, and recent immigrant groups. Prerequisite: 42:147 or consent of instructor.

42:228 Theories of Personality and Psychopathology **2 s.h.**
Overview and comparison of selected theories of personality and psychopathology and their relevance to social work practice with diverse populations. Open only to social work program graduate students or to others with consent of instructor. Prerequisite: 42:140 or consent of instructor.

42:229 Working with Groups **2 s.h.**
Theory and practice of group work, group process, and leadership styles and skills; fundamental theory and skills necessary to form and facilitate a small group. Prerequisite: completion of foundation courses or consent of instructor.

42:232 Therapy with Couples **2 s.h.**
Married and other couples as social systems; theories of functional and dysfunctional systems; techniques of intervention. Prerequisite: completion of foundation courses or consent of instructor. Same as 7C:232.

42:233 School Social Work Practice **2 s.h.**
The school as a social institution and activities of the school social worker; selected theoretical and practice issues; current issues in the field.

42:235 Clinical Interventions with Individuals **2 s.h.**
Several intervention theories and practice skills with attention to object relations theory and therapy as a bridge between a systemic perspective and working with individuals. Prerequisite: completion of foundation courses and 42:250; or consent of instructor.

42:236 Treatment of Eating Disorders **2 s.h.**
Restrictive eating disorders analyzed in the context of society's concern with obesity and dieting; gender, developmental, familial, and cultural issues. Open only to graduate students or to others with consent of instructor.

42:237 Social Work Practice with Children, Youth, and Families **2 s.h.**
Preparation for practice in child welfare and family service agencies; family life cycle, child development, child maltreatment, problems of adolescence, social services for families and children, legal issues. Prerequisite: completion of foundation courses or consent of instructor.

42:250 Family Systems Theories **3 s.h.**
Communication and family systems theories compared to other theories of personal change; skill development in analyzing problems, implementing change strategies, theory analyses, and development of hypotheses. Prerequisite: completion of foundation courses or consent of instructor.

42:251 Family Therapy **3 s.h.**
Specific techniques for assessment and intervention in family therapy and for evaluation of the student's own practice; theoretical bases for intervention. Prerequisite: 42:250 or consent of instructor. Same as 7C:251.

42:252 Family Policy: Domestic and International **3 s.h.**
Development and current status of the family: its forms, functions, and relation to other institutions; analyses of social policies affecting families; comparative and international focus. Prerequisite: completion of foundation courses or consent of instructor.

42:260 Interdisciplinary Systems Theories **3 s.h.**
General theory base for social work practice in interdisciplinary settings such as schools, hospitals, and industry; theories of inter- and intra-organizational and group dynamics upon which practice interventions in interdisciplinary settings are based. Prerequisite: completion of foundation courses or consent of instructor.

42:261 Social Work Practice in Interdisciplinary Settings **3 s.h.**
Practice theories, interventions, and skill building for social work in interdisciplinary settings; practice interventions including clinical and organizational development approaches and skill building in assessment, case coordination, case management, consultation, planning. Prerequisite: 42:260 or consent of instructor.

42:262 Social Policy and Interdisciplinary Systems, Domestic and International **3 s.h.**
Analysis of social policies affecting social work in interdisciplinary settings such as health, education, and

employment policy; history, goals, benefits, financing, evaluation, and alternatives; comparative and international focus. Prerequisite: completion of foundation courses or consent of instructor.

***42:270 Advanced Research** **3 s.h.**
Research skills applied to topics such as needs assessment, program evaluation, policy analysis, and evaluation of social work practice. Open only to social work program students. Prerequisite: 42:144 or equivalent.

***42:271 Individual Study** **arr.**
Project related to student's interest carried out under direction of faculty member; sometimes includes group participation. May be repeated. Open only to students admitted to the Graduate College.

***42:272 Thesis** **arr.**
Overview and comparison of selected theories of organizations and social change, establishment of a theory base for macropractice in social work; social and organizational development. Open only to social work program students or to others with consent of instructor.

42:273 Women and Social Change: International Development Perspectives **3 s.h.**
Women's social, political, and economic lives in response to development in Africa, Latin America, Asia, and the United States from an interdisciplinary perspective. Prerequisite: 42:143 or consent of instructor. Same as 131:273.

42:275 Development Policy and Planning in Third World **3 s.h.**
Cross-cultural and interdisciplinary analysis of problems associated with urbanization and development in the developing nations. Same as 6E:234, 34:275, 44:275, 102:275, 113:275, 7F:275.

42:277 Organizational and Community Planning **2 s.h.**
Principles, ideology, and values of technocratic and developmental models of planning; stresses skills such as needs assessment, goal setting and strategizing, grant writing, and assessment of planning process and outcomes. Prerequisite: completion of foundation courses or consent of instructor.

42:278 Personnel and Financial Management **2 s.h.**
Identifies the human and financial resources required by communities and organizations for the delivery of social services; skill development in personnel and financial management, microcomputer applications, and evaluation of management outcomes. Prerequisite: completion of foundation courses or consent of instructor.

42:280 Human Behavior: Selected Aspects **arr.**
Topics not covered in other courses.

42:281 Social Work Practice: Selected Aspects **arr.**
Topics not covered in other courses.

42:282 Social Welfare Policy: Selected Aspects **arr.**
Topics not covered in other courses.

42:284 Treatment Approaches to Substance Abuse and Dependency **3 s.h.**
Same as 7C:285.

42:285 Travel/Study Seminar **arr.**
Study on campus plus travel to appropriate sites for observation and interaction with resource persons not on campus. Prerequisite: 42:143 or consent of instructor.

42:286 Social Welfare Seminar **1 s.h.**
Seminars for small groups of graduate students interested in specific areas, such as community mental health, public welfare, rural social work, social work with minority and international populations, and occupational social work. Consent of instructor required.

***42:290 Foundation Practicum in Social Work** **3 s.h.**
Generalist practice experience with individuals, families, small groups, organizations, and communities; communication skills, the problem-solving process, and professional values and ethics applied at all system levels; students evaluate their own practice. Open only to M.S.W. program students. Pre- or corequisites: 42:140, 42:141, 42:142, 42:143, 42:144, 42:145, 42:146, 42:147, and 42:291.

***42:291 Foundation Practicum Seminar** **1 s.h.**
Integration of academic and experiential learning; development of self-assessment and peer feedback to promote model of professional accountability. Open only to M.S.W. students. Prerequisites: 42:140, 42:141, 42:142, 42:145, and 42:146. Corequisites: 42:143, 42:144, 42:147, and 42:290.

***42:292 Advanced Practicum in Family Systems** **arr.**
Practice experience applying family systems theories in primary social work settings; self-evaluation, ongoing consultation and assessment of effective intervention skills guided by practicum instructors. Prerequisite: completion of foundation courses or consent of instructor.

***42:293 Advanced Practicum Seminar in Family Systems I** **1 s.h.**
Integration of family systems theories with practice experience; consultation and self-assessment as measures of intervention effectiveness in work with individuals, families, and small groups. Corequisite: 42:292.

***42:294 Advanced Practicum Seminar in Family Systems II** **1 s.h.**
Corequisite: 42:292.

***42:295 Advanced Practicum in Interdisciplinary Systems** **arr.**
Practice experience in interdisciplinary settings such as schools, hospitals, and industry; inter- and intra-organizational and group dynamics theories applied to self-assessment and supervision of skill building by practicum instructors. Prerequisite: completion of foundation courses or consent of instructor.

***42:296 Advanced Practicum in School Social Work** **arr.**
Social work practice in a school setting under instruction of a practicum teacher. Prerequisite: completion of foundation courses or consent of instructor.

***42:297 Advanced Practicum Seminar in Interdisciplinary Systems I** **1 s.h.**
Social work role within an interdisciplinary setting; integration of social work theories and values in interdisciplinary settings. Corequisite: 42:295.

***42:298 Advanced Practicum Seminar in Interdisciplinary Systems II** **1 s.h.**
Corequisite: 42:295.

SOCIOLOGY

Chair: Jae-On Kim
Professors: Carl J. Couch, Guillermina Jasso, Jae-On Kim, Edward J. Lawler, Charles W. Mueller, David A. Parton, James L. Price, Cecilia Ridgeway, Lyle W. Shannon
Associate professors: Barry Markovsky, Robert Nash Parker, Hallowell Pope, John R. Stratton, Stephen G. Wieting
Assistant professors: Scott Eliason, Rosemary Gartner, Lingxin Hao, David Strang, Robin Stryker
Undergraduate degrees offered: B.A., B.S. in Sociology
Graduate degrees offered: M.A. in Criminal Justice and Corrections; M.A., Ph.D. in Sociology

Undergraduate Programs

The undergraduate major in sociology provides a liberal arts education. The program is not oriented to a specific career field, but completion of baccalaureate study in sociology provides background for employment in fields such as social services, criminal justice, personnel, applied social research, community organizations, and teaching social science in secondary schools. The program also provides a foundation for graduate or professional study in social work, urban planning, law, criminal justice, social policy, and similar areas. Finally, the degree prepares students for work toward advanced degrees in sociology, which qualify them for college or university teaching and academic, private, and governmental research positions.

Undergraduate students majoring in sociology may elect either a Bachelor of Arts or a Bachelor of Science degree program; students interested in careers in the social sciences are advised to seek the Bachelor of Science degree.

Both programs require 27 semester hours of course work in sociology, including:

34:1 Introduction to Sociology: Principles	3 s.h.
34:2 Introduction to Sociology: Problems	3 s.h.
34:10-11 Theory, Research, and Statistics	6 s.h.
Electives	15 s.h.

The student should complete the two-semester theory, research, and statistics course work early to maximize his or her capacity to benefit from the other sociology courses.

To encourage development of a broad knowledge of sociology, the department requires that majors complete at least one course numbered 100 or above in each of three areas selected from the following (see "Advanced Courses" in this section of the *Catalog*): social theory; statistics and methods of research; social psychology; deviance, delinquency, crime, and law; family, life-styles, children, and aging; social institutions and social change; community and population; social class, inequality, race, and organizations. This requirement does not apply to minors in sociology.

In addition to the sociology requirements listed above, the B.S. program in sociology requires the following:

26:103 Introduction to Symbolic Logic	3 s.h.
or	
26:104 Introduction to Philosophy of Science	3 s.h.
22S:25 Elementary Statistics and Inference	3 s.h.

One of these three combinations:

22M:10 Finite Mathematics	4 s.h.
and	
22M:11 Introduction to Calculus with Applications	4 s.h.
or	
22M:10 Finite Mathematics	4 s.h.
and	
22M:19 Elementary Functions	3 s.h.
or	
22C:16 Introduction to Programming with Pascal	4 s.h.
and	
22C:17 Programming Techniques & Data Structures	3 s.h.

Students with exceptionally strong high school backgrounds in mathematics may substitute 22M:25-26 Calculus I-II for the mathematics option listed above. All majors are advised to take at least one basic course in history and philosophy and 6 semester hours of course work in at least one of these departments: anthropology, economics, geography, political science, or psychology. A list of complete requirements

for a sociology major is available in the department office.

Departmental requirements are the same for transfer students as for other students. While some courses taken at other colleges are applicable toward the major, the department requires that transfer students majoring in sociology take at least 12 semester hours in sociology at The University of Iowa.

Students who wish to obtain teacher certification in the social sciences while majoring in sociology should contact the Secondary Education Division in the College of Education.

Minor

In addition to its programs for majors, the department provides supportive course work and several course clusters of value to undergraduate students who want to combine a minor in sociology with a major in another field, particularly another social science, business administration, elementary education, or nursing. The requirements for a sociology minor are:

A minimum of 15 semester hours of credit in sociology courses with a minimum grade-point average of 2.00;

At least 12 of the 15 semester hours must be taken at The University of Iowa in courses numbered 34:100 and higher; and

No course accepted toward the minor may be taken pass/nonpass.

A brochure describing minors in sociology is available in the department office.

Honors

The College of Liberal Arts Honors Program provides a stimulating and integrative educational experience for undergraduate majors who perform at a high level. To qualify for the honors program in sociology, students must have a grade-point average of 3.20 overall and in sociology courses. The honors curriculum consists of limited-enrollment classes in which students explore in-depth issues of mutual interest with faculty and other honors students. The special requirements for an honors degree in sociology are completion of 34:100 Honors Proseminar in the junior year, one advanced undergraduate course or graduate course approved by the honors director, and an honors thesis. The honors thesis gives students an opportunity to do sociological research in consultation with a faculty member of the student's choice. As an option, honors students may take the honors section of 34:1 Introduction to Sociology: Principles, thereby waiving the course requirement of 34:2 Introduction to Sociology: Problems for a degree in sociology.

Graduate Programs

The graduate programs in sociology are preparation for professional careers. Depending on which program the student chooses, the master's programs prepare the student for doctoral studies or for professional positions applying sociology. The doctoral program has a research emphasis and primarily prepares sociologists for positions in colleges and universities or research in academic, private, and government positions. Opportunities for research using survey, experimental, and observational methods are readily available in the department.

Master of Arts

The M.A. degree in sociology requires 30 semester hours with thesis or 38 semester hours without thesis. The program without thesis is intended for persons who desire a terminal degree and for whom a wider range of course content in sociology is appropriate.

All candidates for the M.A. degree must complete the following with grades of B or higher:

34:201 History of Sociological Theory	3 s.h.
34:202 Sociological Theory	3 s.h.
34:214 Elementary Statistics and Data Analysis	3 s.h.
34:215 Sampling, Measurement, and Observation Techniques	3 s.h.

M.A. in Criminal Justice and Corrections

This program is designed for individuals who wish to work in criminal justice. Since it is assumed that a sociological orientation and background is extremely valuable for such work, the major emphasis of the program is sociological. It also is recognized that specialized knowledge is essential to performance of specific criminal justice roles; therefore, students may select 15 semester hours of course work in areas such as legal process, administrative procedure, or direct intervention techniques in order to broaden their knowledge. The flexible curriculum allows students, in consultation with their adviser, considerable choice in selecting courses that will best enable them to achieve their career goals.

A limited number of students enter the program each year, so a low student-faculty ratio is maintained. Internships are available with local criminal justice agencies. Successful completion of this program requires a minimum of 36 graduate credits, a 3.00 grade-point average on all work taken, and a master's paper (not a thesis).

Joint Program in Sociology and Law

Students may obtain a Master of Arts in sociology and a Juris Doctor by fulfilling the basic requirements of both programs. The College of Law permits students to apply for up to 12 semester hours of credit for graduate work that they take after entering the joint program toward the 90 hours required for the J.D., even though those hours are also credited toward the M.A. in sociology.

At the discretion of the student's M.A. committee, the Department of Sociology may apply up to 12 semester hours of credit for law course work toward the M.A. degree. This cross crediting allows students to receive the J.D. and the M.A. by taking less course work than would be necessary if the two degrees were pursued independently. This program is highly individualized, allowing students to explore various aspects of the relationship between law and society.

Doctor of Philosophy

The Ph.D. degree in sociology requires a minimum of 72 semester hours of graduate-level course work, including the post-M.A. course 34:216 Intermediate Statistics and Data Analysis and 3 elective semester hours in methods/statistics. Candidates also must pass comprehensive examinations and write a dissertation.

All doctoral candidates are examined in the basic tool areas of sociology—theory, history of theory, methodology, and statistics—and on one major and one minor area chosen from the areas represented by the faculty, such as social psychology, deviance, criminology, family, social stratification, organizations, demography, theory, methods, and statistics. A description of faculty interests is available upon request.

A detailed statement of regulations for graduate study also is available upon request. Prospective doctoral candidates should examine this statement carefully.

Special Workshops

The department organizes a series of workshops each semester on new and interesting research methods not covered in the standard methods sequence. Each workshop informs students about the problems for which the method is applicable, gives an introduction to its theory, and shows how the method is actually used in a research setting. Topics covered in recent years include LISREL, meta-analysis, simulation techniques, event history analysis, and time-series analysis.

A biweekly theory workshop on tools and methods used in theoretical analysis attracts both faculty members and graduate students. Workshop participants critique a paper, which has been distributed a week before the session.

Admission

Admission to graduate study in sociology usually requires a minimum undergraduate grade-point average of 3.00 and a total score of 1100 from the quantitative plus verbal sections of the Graduate Record Examination (GRE) General Test. Foreign students whose native language is not English should submit scores from the

TOEFL exam. In addition to fulfilling the Graduate College requirements for admission (see the "Graduate College" section of the *Catalog*), the applicant must complete a departmental application statement and use its personal reference forms in obtaining three letters of recommendation.

Applications should be submitted at least two months before the start of the academic session for which admission is requested. The deadline for applying for departmental financial support is March 1, although evaluation of applications begins in January.

Admission decisions are based on consideration of prior academic performance, personal reference letters, scores on the GRE General Test, and the applicant's statement of reasons for pursuing advanced work in sociology. The department has no specific undergraduate course requirements for admission, but a background in the social sciences with some mathematical training is useful. A foreign language is not required for admission and there are no foreign language requirements for either the M.A. or Ph.D. degrees in sociology. Inquiries concerning admission should be directed to the chair of the admissions committee, Department of Sociology.

Admission to the M.A. program in criminal justice and corrections requires a B.S. or a B.A. degree, a grade-point average of 2.75, and a total score of 1000 from the quantitative plus verbal sections of the GRE General Test. A descriptive publication is available at the department office.

Financial Aid

The Department of Sociology offers four types of awards to graduate students: teaching assistantships, research assistantships, University of Iowa Fellowships, and graduate Opportunity of Iowa Fellowships. Resident tuition is charged to out-of-state students who receive awards. Students who receive one-half-time assistantships work 20 hours each week for faculty members on either teaching or research assignments. The department also may offer tuition scholarships to some students.

Research Facilities

Social Psychology

The department's 18-room small-group laboratory includes eight computer-controlled subject rooms with audiovisual and psychophysiological recording capabilities, two large-group rooms with an adjoining observation room, an audiovisual control room, an instrument shop, and other flexible research office spaces.

Survey

The Social Science Survey Research Center and the Iowa Urban Research Center offer facilities, staff, and data archives for conducting surveys and secondary data analysis. Computer-aided telephone surveys can be conducted, and an annual Midwest opinion survey is ongoing.

Computer Facilities

The department operates a remote computer terminal and personal computer cluster adjacent to graduate student offices. Both terminals and personal computers can access main-frame computers that provide all of the popular statistical and mathematical computing programs.

Courses

For Undergraduates Only

Courses open to freshmen without prerequisites: 34:1, 34:2, and 34:120. All other undergraduate courses are open to freshmen with stated prerequisites.

34:000 Cooperative Education Internship **0 s.h.**
Registration during work assignment periods; permanent record of internships. Open only to sociology majors. May be repeated. Consent of adviser required. Prerequisite: admission to Cooperative Education Program.

34:1 Introduction to Sociology: Principles **3 s.h.**
How individuals are organized into social groups, ranging from intimate groups to bureaucracies, and how these influence individual behavior; nature and interrelationships of basic social institutions such as family, education, religion, economy. GER: social sciences.

34:2 Introduction to Sociology: Problems **3 s.h.**
Emergence and distribution of selected social problems; alternative solutions; social problems may include population, inequality, female-male relationships, racism, and crime. GER: social sciences.

34:10 Theory, Research, and Statistics **3 s.h.**
Introduction to basic scientific concepts; emphasis on theoretical thinking, the statement of researchable propositions, and the logic and meaning of proof operant in the research process; general issues associated with designing social research, including problems of sampling and measurement, analysis, presenting research data, and interpreting research findings. Prerequisites: 34:1, 34:2, and a declared sociology major.

34:11 Theory, Research, and Statistics **3 s.h.**
Continuation of 34:10, which is prerequisite. Open only to sociology majors.

34:100 Honors Proseminar **2 s.h.**
Discussion of sociological topics with other honors students and faculty; assists students in generating and developing a topic for their honors papers. Open only to sociology honors students. Offered spring semesters.

34:111 Analysis and Interpretation of Social Facts **3 s.h.**
Data analysis and interpretation through examination of social facts in their multivariate context; logic of multivariate controls and its application through the use of computer programs. Prerequisites: 34:10 and 34:11, or equivalent; or consent of instructor.

34:163 Comparative Sociology **3 s.h.**
Comparison of different societies or nations; focus on competing analyses of a selected topic (e.g., the rise of capitalism). Prerequisite: 34:1 or 34:2 or consent of instructor.

34:196 Field Experience **arr.**
Supervised field experience relating to sociology. Consent of adviser required. Prerequisites: major in sociology, junior standing or above.

34:198 Directed Individual Study **arr.**
For students who wish to pursue interests not covered by other courses. May be repeated. Consent of instructor required.

34:199 Honors Research **arr.**
Faculty-supervised special research projects. Consent of instructor required.

Advanced Courses

Social Theory

34:190 Classical Sociological Theory **3 s.h.**
Classical sociological works that have had a major impact on modern sociological theory. Prerequisite: social science major or consent of instructor.

34:191 Contemporary Sociological Theory **3 s.h.**
Contemporary sociological theory; general perspectives that guide sociological work, specific theories that have generated substantial research, and issues in the construction, analysis, and evaluation of theories. Prerequisite: social science major or consent of instructor.

34:200 Graduate Proseminar **1 s.h.**
General introduction to department and discipline for entering graduate students; departmental and graduate college requirements, program and career planning, interaction with faculty members, and consideration of student interests and concerns. A two-semester course beginning fall semesters.

34:201 History of Sociological Theory **3 s.h.**
Examination of ideas of major nineteenth- and twentieth-century social thinkers (e.g., Marx, Weber, Durkheim, Simmel, Mead). Prerequisite: graduate standing or consent of instructor.

34:202 Sociological Theory **3 s.h.**
Contemporary theoretical issues and nature of theory, place of theory in research, strategies of theory construction. Prerequisite: graduate standing or consent of instructor.

34:203 Seminar: Sociological Theory **3 s.h.**
Selected problems in sociological theory. May be repeated. Prerequisite: 34:201 or consent of instructor.

34:204 Sociology of Knowledge **3 s.h.**
Role of ideas, belief systems, and ideologies in social life; focus on the relationship between ideas and the social context at microsociological and/or macrosociological levels. Consent of instructor required.

Statistics and Research Methods

34:184 Applied Sociology: Fundamentals **3 s.h.**
Surveys types of evaluation research; focus on problem formulations, ethical practices, and writing reports based on quantitative and qualitative information. Consent of instructor required. Prerequisite: 34:11 or equivalent.

34:185 Applied Sociology: Practice **3 s.h.**
Field experience in evaluation research; continues topics introduced in 34:184. Consent of instructor required. Prerequisite: 34:184.

34:212 Introduction to Analytic Methods **3 s.h.**
Essential mathematical and logical background for understanding contemporary social science analytic techniques. Prerequisite: graduate standing or consent of instructor.

34:214 Elementary Statistics and Data Analysis **3 s.h.**
Commonly used measures of statistical association; logic of statistical inference and hypothesis testing; contingency tables and linear regression as techniques of statistical control; computer applications. Prerequisite: introductory statistics or consent of instructor.

34:215 Sampling, Measurement, and Observation Techniques **3 s.h.**
Research designs; sampling designs and techniques; questionnaire construction, interviewing techniques; participant and nonparticipant observation; coding and preparation of data for analysis; measurement techniques, reliability, and validity. Prerequisite: 34:214 or consent of instructor.

34:216 Intermediate Statistics and Data Analysis **3 s.h.**
Multivariate statistical techniques associated primarily with the general linear model; emphasis on multiple regression, analysis of variance and covariance, and corresponding computer programs. Prerequisites: 34:214 and 34:215, or equivalent.

34:217 Theory and Research Design **3 s.h.**
Theory building and problem formulation; operationalization and redefinition of theoretical variables; choice of strategic research sites; experimental, quasi-experimental, and survey research designs;

development and testing of causal models. Prerequisite: 34:216.

34:218 Advanced Statistics and Data Analysis 3 s.h.
May be repeated. Consent of instructor required. Prerequisite: advanced graduate standing.

34:219 Seminar in Research Methods and Data Analysis 3 s.h.
May be repeated. Consent of instructor required. Prerequisite: advanced graduate standing.

34:380 Modular Topics in Methods and Statistics arr.
Selected methods and statistics topics not included in required or currently offered courses; modules of varying length and credit. May be repeated. Consent of instructor required. Prerequisite: graduate standing.

Social Psychology

34:120 Principles of Social Psychology 3 s.h.
Introduction to theory and research in small groups; interpersonal and intergroup processes.

34:122 The Paranormal Society 3 s.h.
Skeptical perspective in analyses of paranormal phenomena and pseudo-sciences; need for explicit theories, extraordinary evidence, and elimination of "normal" explanations before extraordinary phenomena are accepted as legitimate.

34:123 Mass Communication 3 s.h.
Forms of communication (oral, written, and electronic) and their interrelation with social structure and processes. Prerequisite: 34:120 or consent of instructor.

34:124 Social Processes: Interpersonal Relations 3 s.h.
Processes of status, friendship, love, justice, and deviance examined by comparing and contrasting role-playing, common-sense explanations, abstract theory; how processes support and interfere with one another. Prerequisite: 34:120 or 31:15 or consent of instructor; graduate students must have consent of instructor.

34:125 Small-Group Analysis 3 s.h.
Analysis of social interaction in groups; group problem solving; group decision making; leader-subordinate relations and place of small groups in large organizations. Prerequisite: 34:120 or graduate standing or consent of instructor.

34:126 Collective Behavior 3 s.h.
Social unrest; crowd behavior; social movements treated as a form of social change. Prerequisite: 34:120.

34:127 Social Forms and Interaction 3 s.h.
Elementary social forms and processes; special emphasis on the study of interaction in various social contexts. Prerequisite: 34:120.

34:129 Development and Control of Aggression 3 s.h.
Analysis of social factors that contribute to development of interpersonal aggression; circumstances culminating in aggression; social requirements for reducing aggression. Prerequisite: 34:120.

34:131 Interpersonal Conflict 3 s.h.
Use of social psychological theory and research to analyze bargaining strategies, negotiations, and conflict resolution. Prerequisite: 34:1 or 34:120 or consent of instructor.

34:132 Social Psychology of Alcohol Use and Community Problems 2-3 s.h.
Alcohol use and abuse and community reaction analyzed in terms of the alcoholic process and the recovery process. Prerequisite: 34:1 or 34:2 or 34:120.

34:136 Social Psychology of Aging 3 s.h.
Theories of social psychology applied to aging; process of identity formation throughout the life cycle; emphasis on relationship between social structure and self-concept. Prerequisite: 34:120 or consent of instructor.

34:220 Contemporary Approaches to Social Psychology 3 s.h.
Review and critical analysis of current theoretical approaches to and systems of social psychological analysis. Prerequisite: graduate standing or consent of instructor.

34:221 Seminar: Selected Topics in Social Psychology 3 s.h.
Selected theoretical and methodological issues. May be repeated. Prerequisite: graduate standing or consent of instructor.

Deviance, Delinquency, Crime, and Law

34:140 Criminology 3 s.h.
Nature and causes of crime; the criminal justice process, correctional treatment, and crime prevention. Prerequisite: 34:1 or 34:2 or consent of instructor.

34:141 Juvenile Delinquency 3 s.h.
Delinquency as an individual and social problem; theories of the causes of juvenile delinquency; law enforcement and the juvenile court; methods of correction and prevention. Prerequisite: 34:1 or 34:2 or consent of instructor.

34:143 Women, Crime, and Deviance 3 s.h.
Sociological understanding of females as participants in and victims of crime and deviance, and the treatment of females in law and the criminal justice system; topics include theoretical approaches to female crime and deviance, types of deviant behavior in women, female victimization, and types and determinants of legal decisions regarding women. Prerequisite: 34:1 or 34:2 or 34:120.

34:145 Sociology of Corrections 3 s.h.
Analytical survey of history, structure, and function of the American correctional process. Prerequisite: 34:140 or 34:141 or consent of instructor.

34:146 Deviance and Control 3 s.h.
Basic theories of deviance and analysis of social control settings and mechanisms, with emphasis on the relationship between social control efforts and social deviance. Prerequisite: 34:140 or 34:141 or consent of instructor.

34:147 Prevention of Crime and Delinquency: Strategies and Problems 3 s.h.
Analysis of intervention strategies in crime and delinquency, emphasizing problems in theory, method, and evaluation of intervention techniques. Prerequisite: 34:140 or 34:141 or consent of instructor.

34:148 Internship in Criminal Justice and Corrections 1-4 s.h.
Supervised field work in a criminal justice or correctional agency, with formal instruction in theory and technique. Offered only satisfactory/fail. May be repeated. Prerequisites: sociology major, junior standing or above, and 34:140 or 34:141.

34:182 Sociology of Law and Criminal Justice 3 s.h.
Formation of law; impact of law in society; structure and operation of the criminal justice system. Prerequisite: 34:140 or 34:141.

34:240 Seminar: Criminological Theories 3 s.h.
Theories of crime causation and their relationships to the cultures in which they have functioned. Prerequisite: graduate standing or consent of instructor.

34:242 Seminar: Sociology of Law 3 s.h.
Law as a social institution; its origin, development, and relationship to culture; social processes, social groups, and other means of social control. Prerequisite: graduate standing or consent of instructor.

34:244 Seminar: Selected Topics in Deviance and Control 3 s.h.
Critical analysis of current research with emphasis on theoretical contributions and methodological foundations. May be repeated. Prerequisite: graduate standing or consent of instructor.

34:247 Seminar: Deviance 3 s.h.
Critical analysis of models of deviance, with emphasis on significant theoretical and methodological issues. Prerequisite: graduate standing or consent of instructor.

Family, Life-Style, Children, Aging

34:108 Women and Society 3 s.h.
Role and status of women in society; sex differences, sex role socialization, theories about origin and maintenance of sexual inequalities, changes in social life cycle of women and implications for social institutions and processes; focus on contemporary United States. Prerequisite: 34:1 or 34:2 or 34:120. Same as 131:108.

34:130 Aging and Society 3 s.h.
Societal age structure; age-status and age-sex roles; correlates of aging; continuities and discontinuities during the life cycle; intergenerational relations; social policy regarding aging and the aged. Prerequisite: 34:1 or 34:2 or 34:120.

34:159 The Family in Various Societies 3 s.h.
Family systems in comparative and historical perspective; comparison of the American family with families in both modern and premodern societies. Prerequisite: 34:1 or 34:2.

34:161 The American Family 3 s.h.
Structure and process: change over the life cycle; interrelations with other institutions; historical changes; variations by social class and ethnic group. Prerequisite: 34:1 or 34:120.

34:162 Courtship, Marriage, and Alternative Life-Styles 3 s.h.
Sex roles and premarital interaction; power, conflict, and satisfaction in marriage; the dual-career family; voluntary childlessness; cohabitation; emphasis on relevant theory and research. Prerequisite: 34:1 or 34:120 or consent of instructor.

34:193 Social Development of Children 3 s.h.
Learning and development of interpersonal behavior from infancy through early adolescence. Prerequisite: 34:120.

34:230 Sociology of the Family 3 s.h.
Review and evaluation of significant research traditions; identification of theoretical problems and data sources. Prerequisite: graduate standing in a social science or consent of instructor.

34:233 Aging and Human Development 3 s.h.
General overview of age and aging as a social phenomenon; age stratification, social change, the life course, the aged as a social problem; selected topics, theoretical and methodological issues. Prerequisite: graduate standing in a social science or consent of instructor.

34:235 Seminar: Sociology of Women 3 s.h.
Theoretical explanations of sexual inequality, including psychological, economic, sociological, Marxist, and feminist perspectives; theoretical and empirical exploration of inequality, with emphasis on work and family experiences and interrelationship of work and family roles. Prerequisite: graduate standing or consent of instructor.

34:269 Seminar: Selected Topics in Family Sociology 3 s.h.
Selected theoretical and methodological issues. May be repeated. Prerequisite: graduate standing in a social science or consent of instructor.

Social Institutions, Social Change

34:22 Introduction to Social Work 4 s.h.
Social welfare as a social institution; settings and methodologies of social work practice; profession of social work; historical development of American social welfare and social work; a minimum of 60 hours volunteer work. Prerequisite: sophomore standing or consent of instructor. Same as 42:22.

34:151 Sociology of the Third World 3 s.h.
Analysis and measurement of development/underdevelopment; ideological perspectives on the Third World; the modern world system; selected issues in the study of social change in Asia, the Mideast, Latin America, and Africa. Prerequisite: 34:1 or an introductory course in economics or anthropology or consent of instructor. Same as 113:151.

34:153 Public Opinion 3 s.h.
Role of public opinion in making public policy; formation and change of political attitudes and opinion; political ideology; measurement of public opinion; understanding opinion polls. Prerequisite: 34:1 or consent of instructor. Same as 30:171.

34:160 American Society 3 s.h.
American society in comparative perspective; its structure and integration; approaches to study of large, complex, modern societies; institutional interrelationships, institutions as agencies of social control, institutional disorganization as an effect of social change. Prerequisite: 34:1 or consent of instructor.

34:168 Economic and Political Development: Women's Roles 3 s.h.
Same as 113:138, 131:168.

34:181 Sociology of Popular Culture 3 s.h.
Analysis of the sociological bases, impact, and implications of popular culture; interrelationships of popular culture and major social institutions; popular culture and social change; social bases of taste; cultures

and publics. Prerequisite: 34:1 or 34:2 or consent of instructor.

34:395 Seminar: Communication and Change 3 s.h.
Theory, research, and methodological problems of studying change; topics include diffusion, innovations, media and change, reform organizations, revolutionary and evolutionary organizations. Prerequisite: graduate standing

Community and Population

34:170 Population and Society 3 s.h.
Factors and processes determining population size, composition, and distribution; relations of population to social organization and human welfare; recent trends in population with resulting problems, policies, and programs. Prerequisite: 34:1 or 34:120 or consent of instructor.

34:172 Immigration to the United States 3 s.h.
Theoretical models of U.S. immigration and their predictions; quality of available data sources; evidence accumulated to date.

34:174 World Population Problems 3 s.h.
World population trends and pressures; their causes and consequences, by countries and world areas; cultural contrasts in migration patterns and family planning. Prerequisite: 34:1 or 34:2 or 34:120 or consent of instructor.

34:175 Elementary Demographic Techniques 3 s.h.
Introduction to the methods, measures, and data used in the analysis of human populations; principles of and techniques for analyzing mortality, nuptiality, fertility, migration, socioeconomic status, and age and sex structure; includes sources and quality of demographic data, population estimation and projection, and stable population theory. Prerequisite: 34:1 or 34:2 or 34:120 or consent of instructor.

34:273 Seminar: Community Research 3 s.h.
Prerequisite: graduate standing.

34:275 Development Policy and Planning in Third World 3 s.h.
Cross-cultural and interdisciplinary analysis of problems associated with urbanization and development in the developing nations. Prerequisite: graduate standing in a social science. Same as 113:275, 6E:234, 7F:275, 44:275, 42:275, 102:275.

34:279 Seminar: Urbanization arr.
Problems arising from the increase in urban population and the relative decline in rural population; emphasis on Iowa and the Midwest. Consent of instructor required. Prerequisite: graduate standing. Same as 7D:301, 30:324, 44:337.

Social Class, Inequality, Race, Organizations

34:150 Political Sociology 3 s.h.
Sociological analysis of political behavior and belief, group conflict and political process, group consensus, political institutions, power and policy-making systems; relationship of the political system to the social system. Prerequisite: 34:1 or 34:2 or consent of instructor.

34:155 Race and Ethnic Relations 3 s.h.
Multidisciplinary study of intergroup relations, with emphasis on historical, sociological, and social psychological issues in the study of American minority groups. Prerequisite: 34:1 or 113:3 or consent of instructor. Same as 113:155, 129:114.

34:156 Gender Inequality 3 s.h.
Gender relations in contemporary perspective; emphasis on social origins of gender categories and implications of gender status for collective behavior and individual behavior; topics include inequalities in interpersonal behavior, the family and work organizations, family violence, sexual harassment, and rape. Prerequisite: 34:1 or 34:2 or 34:120.

34:164 Organizations and Modern Society 3 s.h.
Approaches to the sociological study of economic and noneconomic organizations; the role of power and authority within the organization, and between the organization and its environment. Prerequisite: 34:1 or 34:2 or 34:120 or consent of instructor.

34:165 Sociology of Work and Occupations 3 s.h.
Work commitment; prestige of occupations; occupational and professional careers; occupational groups and organizations; alienation; women, minorities, and occupational structures; capitalism and occupations. Prerequisite: 34:1 or 34:2 or 34:120 or consent of instructor.

34:166 Social Inequality 3 s.h.
Major theoretical perspectives for understanding economic, power, and prestige inequality; the magnitude of social inequality in the United States; sex and race inequality; trends in and causes of social mobility; selected consequences of social inequality. Prerequisite: 34:1 or 34:2 or consent of instructor.

34:250 Seminar: Political Sociology 3 s.h.
Selected topics in political sociology. Prerequisite: graduate standing or consent of instructor.

34:253 Social Stratification 3 s.h.
Classical and contemporary theories of stratification; current research on the causes and magnitude of inequality in economics, power, and prestige; social mobility; critical issues in stratification. Prerequisite: graduate standing.

34:255 Seminar: Social Stratification 3 s.h.
Selected theoretical and substantive issues in social stratification. Prerequisite: graduate standing or consent of instructor.

34:257 Labor Markets 3 s.h.
Sociological and economic theories and research concerning area/regional/local labor markets, industrial sectors and the dual labor market, occupational/internal labor markets; other structural explanations of inequality. Prerequisite: graduate standing or consent of instructor.

34:268 Seminar: Occupational Structure and Social Mobility 3 s.h.
Conceptualization and measurement of social mobility; cross-cultural comparisons and trends in mobility; current research on U.S. mobility with emphasis on race and sex differences. Prerequisite: graduate standing or consent of instructor.

34:284 Seminar: Organizations 3 s.h.
Selected problems in organizational theory. Prerequisite: graduate standing or consent of instructor.

34:285 Complex Organizations 3 s.h.
Introduction to the study of organizations; topics include productivity, effectiveness, innovation, coordination, conformity, and satisfaction. Prerequisite: graduate standing or consent of instructor.

34:286 Methods of Organizational Research 3 s.h.
Selected topics. Prerequisite: graduate standing or consent of instructor.

Independent Reading and Research

34:383 Readings and Research Tutorial arr.
May be repeated. Consent of supervising faculty member required.

34:385 Master's Thesis arr.

34:386 Ph.D. Dissertation arr.

SOVIET AND EAST EUROPEAN STUDIES

Codirectors: Steven Hoch (History), Ray Parrott (Russian), William Reisinger (Political Science)
Professors: Hanno Hardt (Journalism and Mass Communication), Norman Luxenburg (Russian), Gerald Nordquist (Economics), Ray Parrott (Russian), Jaroslaw Pelenski (History), Donald Smith (Journalism and Mass Communication), Harry Weber (Russian)
Associate professors: Paul Adams (Social Work), Steven Hoch (History), Vadim Kreyd (Russian), William Reisinger (Political Science), Christopher Wertz (Russian) **Assistant professors:** Miriam Gelfand (Russian), Margaret Mills (Russian), Vicki Templin (Political Science)
Undergraduate degree offered: B.A. in Soviet and East European Studies

In concert with its priorities of liberal arts, interdisciplinary, and international education, and in response to a critical national need for highly-trained Soviet-area specialists, The University of Iowa in 1989 established the Program in Soviet and East European Studies (SEES). The SEES program is designed to improve and expand the systematic training of undergraduates both in area studies of the Soviet Union and Central and Eastern Europe and in advanced Russian language skills.

For more than four decades, the Soviet bloc countries have greatly affected the lives of Americans. Throughout the Cold War era, United States-Soviet relations were the lodestone of American foreign policy and shaped many domestic policies in the United States as well as in the eastern bloc. The momentous economic, political, and social change that began sweeping Central and Eastern Europe and the Soviet Union at the turn of the 1990s continues to make this area of the world pivotal to U.S. interests.

Undergraduate Program

The new Bachelor of Arts degree in Soviet and East European Studies is a multidisciplinary program that builds on the strengths of the University's Department of Russian, key faculty in the social sciences and humanities, and an institutional emphasis on interdisciplinary programs. Currently, participating in the program are 15 faculty members from the Departments of Economics, History, Political Science, and Russian as well as the Schools of Journalism and Mass Communication and Social Work. Students in the program seek training for a wide variety of professions requiring specialization in Soviet and East European Studies.

The large number of governmental agencies that annually interview job candidates for positions in translation and interpretation, research, information analysis, and policy formulation almost invariably give preference to applicants who couple a well-rounded background in area studies with strong language proficiency. For this reason, the SEES major at Iowa requires three years of college-level training in the Russian language, or its equivalent, rather than the two-year requirement found in comparable Soviet and East European Studies programs nationwide. This unique feature of the Iowa major provides its graduates with a competitive edge in their career opportunities and appointments.

Curriculum

Students pursuing the Bachelor of Arts in Soviet and East European Studies must meet the general College of Liberal Arts degree requirements (see the "College of Liberal Arts" introductory section of the *Catalog*) and earn at least 33 semester hours of credit in the program. The major requires:

Completion of the interdisciplinary course 41S:100 Introduction to the Soviet Union (3 s.h.);

Achievement of third-year college-level proficiency in the Russian language (up to 24 semester hours of study, depending upon the student's prior training in the language);

Completion of nine additional courses (27 s.h.) from a core group including two courses each in history and political science, one area-related course in economics, and one area-related course in either journalism and mass communication, Russian, or social work; and

41S:190 Senior Seminar (3 s.h.).

The existing core courses for Soviet and East European studies represents regularly offered undergraduate and graduate courses.

Sample Course of Study

Freshman Year

Fall Semester

41S:100 Introduction to the Soviet Union	3 s.h.
41:1 First-Year Russian I	4 s.h.
6E:1 Principles of Microeconomics	3-4 s.h.
General education electives	4-6 s.h.

Spring Semester

6E:2 Principles of Macroeconomics	3-4 s.h.
16E:177 Imperial Russia: 1801-1917	3 s.h.
41:2 First-Year Russian II	4 s.h.
General education electives	4-6 s.h.

Sophomore Year

Fall Semester

16E:176 Imperial Russia 1598-1801	3 s.h.
16E:178 Soviet Union 1917-1953: Revolution and the New Regime	3 s.h.
41:3 Second-Year Russian I	4 s.h.
General education electives	4-6 s.h.

Spring Semester

6E:164 The Soviet Economy	3 s.h.
16E:179 Soviet Union 1953-Present	3 s.h.
41:4 Second-Year Russian II	4 s.h.
General education electives	4-6 s.h.

Junior Year

Fall Semester

16E:176 Imperial Russia, 1598-1801	3 s.h.
19:155 Mass Media and Society	3 s.h.
30:141 Intro to Soviet Government and Politics	3 s.h.
41:111 Third-Year Russian I	4 s.h.
General education electives	3-4 s.h.

Spring Semester

19:156 Comparative Communication Systems	3 s.h.
30:142 Government and Politics of the Soviet Union and Eastern Europe	3 s.h.
41:112 Third-Year Russian II	4 s.h.
General education electives	4-6 s.h.

Senior Year

Fall Semester

6E:125 International Economics	3 s.h.
16E:175 Muscovite Russia: 1280-1598	3 s.h.
30:167 Nuclear Strategy and Arms Control	3 s.h.
41:185 Russian Culture	3 s.h.
General education electives	3-4 s.h.

Spring Semester

6E:166 The Political Economy of Socialism	3 s.h.
16E:188 Contemporary European News Colloquium	3 s.h.
30:168 Soviet Foreign Policy	3 s.h.
41:182 Soviet Literature since Stalin	3 s.h.
41S:190 Senior Seminar	3 s.h.

Honors

The program leading to a B.A. degree with honors is open to students with a minimum cumulative grade-point average of 3.20. To graduate with honors, students must maintain at least a 3.50 grade-point average in the Soviet and East European Studies program and a cumulative grade-point average of at least 3.20. Honors students take 12 semester hours of course work with a grade of B or higher in each course. Courses include honors seminars in economics, history, journalism and mass communication, political science, Russian, and social work, as appropriate. The last 3 semester hours may be earned by completing an honors research project directed by faculty members from at least two SEES disciplines. Students interested in seeking a B.A. degree with honors should contact the College of Liberal Arts Honors Program and the SEES program honors adviser before they begin their junior year.

Joint Programs

Joint programs leading to a double major in Soviet and East European Studies and another discipline can be managed without difficulty. Double majors are appropriate in all the program's constituent disciplines, especially in the Russian language. Other combinations are possible as well. In most cases, some courses count toward requirements in each major.

Supplementary Study Programs

The SEES program encourages all participants to explore opportunities for internships with governmental departments and agencies, nonprofit organizations and institutions, and businesses. Internships not only enrich the student's learning from course work but may also lead to enhanced employment opportunities after graduation. In some cases, academic credit may be arranged for an internship.

Study Abroad

Students who wish to enrich their education through study abroad are strongly encouraged to do so. The SEES faculty stands ready to assist qualified students in selecting foreign-study programs and institutions best suited to their educational objectives and needs. There are numerous programs available to students who desire to pursue both language and cultural training in Bulgaria, Czechoslovakia, East Germany, Hungary, Poland, Rumania, and Yugoslavia. The best study-abroad programs in the Soviet Union are described in the Department of Russian section of the *Catalog*. Students are increasingly able to apply directly for admission to almost all institutes of higher learning throughout Central and Eastern Europe as well as the Soviet Union.

SEES Area Courses

Course descriptions are available in the appropriate departmental sections of the *Catalog*.

Economics

*6E:001 Principles of Microeconomics	3-4 s.h.
*6E:002 Principles of Macroeconomics	3-4 s.h.
6E:125 International Economics	3 s.h.
6E:164 The Soviet Economy	3 s.h.
6E:166 The Political Economy of Socialism	3 s.h.
6E:197 Honors Seminar (Gerald Norquist)	arr.

*These courses are prerequisites to the economics curriculum as an area of concentration; they do not count toward 27 semester hours of course work required for the Bachelor of Arts.

History

16:51 Colloquium for History Majors	3 s.h.
16:104 Honors Seminar	arr.
16E:164 Modern European Social Thought: Adam Smith to Marx	3 s.h.
16E:165 Marx	3 s.h.
16E:174 Medieval Russia	3 s.h.
16E:175 Muscovite Russia 1280-1598	3 s.h.
16E:176 Imperial Russia 1598-1801	3 s.h.
16E:177 Imperial Russia 1801-1917	3 s.h.
16E:178 Soviet Union 1917-1953	3 s.h.
16E:179 Soviet Union 1953-Present	3 s.h.
16E:188 Contemporary European News Colloquium	3 s.h.

Journalism and Mass Communication

19:155 Mass Media and Society	3 s.h.
19:156 Comparative Communication Systems	3 s.h.
19:180 Special Projects in Mass Communication	arr.
19:181 Readings in Communication and Mass Communication	3 s.h.
19:190 Honors Readings	1-3 s.h.

Political Science

30:41 Introduction to the Politics of Communist Systems	3 s.h.
30:141 Introduction to Soviet Government and Politics	3 s.h.
30:142 Government and Politics of the Soviet Union and Eastern Europe	3 s.h.
30:156 Politics of Ethnic and Cultural Conflict	3 s.h.
30:167 Nuclear Strategy and Arms Control	3 s.h.
30:168 Soviet Foreign Policy	3 s.h.
30:183 Honors Seminar on Comparative Politics	3 s.h.
30:184 Honors Seminar on International Politics	3 s.h.

Russian

41:151 Russian Literature in Translation: 1800-1860	3 s.h.
41:152 Russian Literature in Translation: 1860-1917	3 s.h.
41:155 Tolstoy and Dostoevsky	3 s.h.
41:181 Soviet Literature to 1954	3 s.h.
41:182 Soviet Literature since Stalin	3 s.h.
41:185 Russian Culture	3 s.h.
41:186 Soviet Union Today	3 s.h.
41:191 Russian Civilization	2-3 s.h.
41:199 Honors	arr.

Courses

41S:100 Introduction to the Soviet Union **3 s.h.**
GER: foreign civilization and culture.

41S:110 Comparative Values: Eastern Europe and the West **3 s.h.**
This course compares the value systems—as practiced in politics, culture and the arts—of the Soviet Union and Central and Eastern Europe with those of the West.

41S:150 Independent Study **arr.**

41S:190 Senior Seminar **3 s.h.**

41S:198 Honors **arr.**

SPANISH AND PORTUGUESE

Chair: Roslyn M. Frank
Professors: Roslyn M. Frank, Oscar Hahn, Joseph Szertics
Professors emeriti: Julio Durán-Cerda, Oscar Fernández, E.W. Ringo
Associate professors: George De Mello, Walter Dobrian, R. Thomas Douglass, Maria A. Duarte, Enrique Fernández-Barros, Nora González, Coleman Jeffers, Philip Klein, Thomas E. Lewis, Adriana Méndez Rodenas, Mario Santizo, Diana Vélez, Irene Wherritt
Assistant professors: Paula M. Kempchinsky, Leslie Schrier, Kathleen E. Newman
Visiting assistant professor: Mercedes Niño-Murcia
Adjunct assistant professors: Ozzie Díaz-Duque, Sue E. Otto
Undergraduate degrees offered: B.A. in Spanish, Portuguese
Graduate degrees offered: M.A., Ph.D. in Spanish

The department provides course work for undergraduate and graduate majors in Spanish or Portuguese, for the satisfaction of foreign language requirements for baccalaureate and advanced degrees in other fields, and for the satisfaction of the second literature requirement for undergraduate majors in comparative literature.

Knowledge of foreign language and culture is indispensable in many career areas. Students majoring in Spanish or Portuguese may find opportunities in fields such as business, transportation, industry, journalism, international broadcasting, publishing, teaching, research, library work, and translating.

Undergraduate Programs

Bachelor of Arts in Spanish

A new Spanish major took effect August 1988. All students now declaring a Spanish major must fulfill the new requirements. Students who began a Spanish major before August 1988 have the option of completing the major under the new requirements presented below or under the old requirements listed in the 1986-88 *General Catalog*. Eligible students who wish to complete the Spanish major under the old requirements must do so by August 1991. No B.A. degrees in Spanish completed under the old requirements will be awarded after August 1991.

Elementary and intermediate courses in Spanish interrelate five performance goals—listening, reading, speaking, writing, and cultural knowledge—in a staged progression that has an overall goal of developing oral proficiency. Emphasis is given to the acquisition of Spanish language skills in communicative contexts, the enrichment of vocabulary through an introduction to Hispanic culture, and the development of grammatical accuracy in speaking and writing. Elementary and intermediate Spanish courses meet daily and are taught in Spanish.

The undergraduate major in Spanish may be completed with an emphasis in Spanish language and linguistics, Latin American studies, or Spanish and Spanish-American literature and culture. The Latin American studies track of the Spanish major requires study of Portuguese language and Brazilian literature and culture, in addition to study of Spanish language and Spanish-American literature and culture.

Language and Linguistics Track

Designed for students interested in pursuing in-depth study of Spanish language and linguistics, and for students who want to prepare themselves for graduate work in Spanish linguistics, careers in secondary education, or a variety of business careers, the language and linguistics track requires a minimum of 34 semester hours of credit in course work, distributed as follows:

35:107 Advanced Spanish Language	4 s.h.
35:111 Introduction to Hispanic Linguistics	3 s.h.
Spanish, Spanish-American, Portuguese, or Brazilian literature or culture	6 s.h.

At least 15 semester hours must be taken from the courses listed below; at least two of the three groups of courses must be represented.

Language

35:108 Problems in Spanish Grammar	3 s.h.
35:109 Senior Spanish Language I	4 s.h.
35:110 Senior Spanish Language II	3 s.h.
35:118 Business Spanish	3 s.h.

Linguistics

35:112 Spanish Phonology	3 s.h.
35:113 Structure of the Spanish Language	3 s.h.
35:114 Topics in Spanish Syntax	3 s.h.
35:121 Pedagogical Applications of Linguistics	3 s.h.
35:122 History of the Spanish Language	3 s.h.

Portuguese

38:100 Accelerated Portuguese	5 s.h.
38:119 Topics in Portuguese Linguistics	3 s.h.
38:121 Portuguese for the Professions	3 s.h.
38:122 Topics in Portuguese Language	3 s.h.

The remaining 6 semester hours of elective course work must be taken at the 100 level in either the Department of Spanish and Portuguese or the Department of Linguistics.

No more than 6 of the 34 semester hours required for the language and linguistics track may be taken in English.

Latin American Studies Track

Designed for students interested in pursuing interdisciplinary study of Spanish-American and Brazilian literature on the basis of knowledge of both Spanish and Portuguese, and for students who want to prepare themselves for graduate work in the humanities or social sciences, for attendance at professional schools such as law, journalism, or business, or for a variety of business careers, the Latin American studies track requires a minimum of 35 semester hours of credit in course work, distributed as follows:

38:100 Accelerated Portuguese	5 s.h.
Additional Spanish or Portuguese language or linguistics	3 s.h.
Spanish-American or Brazilian culture	6 s.h.
Spanish-American literature	6 s.h.
Brazilian literature	3 s.h.
Latin American Studies Seminar or another approved undergraduate seminar	3 s.h.
Electives that are approved courses in the Latin American Studies Program	9 s.h.

No more than 9 of the 35 semester hours required in the Latin American studies track may be taken in English.

Students completing the Latin American studies track of the undergraduate major in Spanish also may count their work toward completion of the Latin American Studies Certificate Program. For additional information, students should contact an undergraduate adviser or the chair of the Latin American Studies Program.

Literature and Culture Track

Designed for students interested in pursuing in-depth study of Spanish and Spanish-American literature, history, and contemporary society, and for students who want to prepare themselves for graduate work in literature, attendance at professional schools such as law, journalism, or business, or for a variety of business careers, the literature and culture track requires a minimum of 34 semester hours of course work, distributed as follows:

35:107 Advanced Spanish Language	4 s.h.
Additional Spanish or Portuguese language or linguistics	6 s.h.
Spanish and Spanish-American literature and culture	24 s.h.

Among the 24 semester hours taken in literature and culture, at least 6 semester hours must be taken in the Spanish area and 6 semester hours in the Spanish-American area.

No more than 3 of the 34 semester hours required in the literature and culture track may be taken in English.

Elementary and Secondary Teaching Certification in Spanish

Spanish majors interested in certification to teach in elementary and/or secondary schools must successfully complete the requirements listed above for any of the three undergraduate tracks in Spanish, as well as be admitted to the College of Education's foreign language teacher education program. Several courses in the College of Education also are required, as is one semester of student teaching, taken in the senior year. Contact the College of Education for further information.

Students who plan to use a Spanish minor to teach at the elementary and/or secondary level must contact the College of Education concerning the requirements.

Honors in Spanish

Admission to the honors program in Spanish requires a minimum 3.20 total cumulative grade-point average and a minimum 3.20 average in Spanish. Graduation with honors in Spanish requires, in addition to the semester hours for the various major tracks described above, 6 semester hours earned in 35:198 Honors: Spanish Literature and/or 35:197 Honors: Spanish Language, an honors essay in Spanish, and an oral examination conducted in Spanish.

Minor in Spanish

A minor in Spanish requires 15 semester hours of course work in Spanish with a minimum grade-point average of 2.00, 12 of which must be taken at The University of Iowa or in a University of Iowa foreign study program in courses numbered 100 and above. The following courses *may not* be elected to fill minor requirements:

35:101 Accelerated Elementary Spanish
35:102 Accelerated Intermediate Spanish
35:105 Language Teaching Practicum
35:115 Methods: Foreign Language
35:117 Topics in Foreign Language Instructional Technology

No more than 3 semester hours may be applied toward the minor from departmental courses taught in English.

Transfer Credit

A maximum of 12 semester hours of credit in approved courses may be transferred from other institutions toward the requirements for the major in Spanish.

International Business Certificate

The Colleges of Liberal Arts and Business Administration offer a joint program leading to a Certificate in International Business. The program entails study of international business and economics; international relations and institutions; a foreign language, such as Spanish or Portuguese; and related area studies. It is designed not only for students who intend to pursue careers in international business, but also for those interested in gaining a better understanding of the global economy and a broader awareness of the political, historical, and social environment in which international business operates.

The wide range of electives in the program permits students to tailor areas of specialization to their interests and to complement majors in both liberal arts and business administration.

For further information, see the College of Business Administration section of the *Catalog* or contact the Office of Academic Programs in the College of Business Administration (121 Phillips Hall) or the Liberal Arts Office of Academic Programs (116 Schaeffer Hall).

Foreign Study Programs

The department participates in eight study-abroad programs. Its summer programs include the Iowa Regents Hispanic Institute (Burgos, Spain) and the CIC Summer Program in Mexico.

Included in its semester or year-long programs are the CIEE Language and Area Studies Program (Alicante, Spain), the CIEE Language and Society Program (Seville, Spain), the CIEE Liberal Arts Program (Seville, Spain), the CIEE Business and Society Program (Seville, Spain), the CIEE Spanish Language and Caribbean Area Studies Program (Santiago, Dominican Republic), and the University Studies in the Basque Country Consortium (San Sebastian, Spain).

Participation in a number of different programs allows the department to offer study-abroad opportunities that take into account a variety of student interests and needs. Credit earned in these or other study-abroad programs may be applied toward the requirements for the Spanish major or minor. The amount of credit that may be accepted varies according to the program. Interested students should contact the department's study-abroad adviser.

Bachelor of Arts in Portuguese

Beginning courses in Portuguese are for students without previous foreign language study or experience. Classes are small, providing for a great deal of individual attention in an informal language-learning environment. Courses emphasize speaking and comprehending basic Brazilian Portuguese; they incorporate cultural material in the form of films and music.

The B.A. in Portuguese requires the following courses or their equivalents, for a total of 27 semester hours of course work beyond the second-year level. Courses listed under "Prerequisites" below, may not be counted toward the 27 semester hours.

Prerequisites

38:1 Elementary Portuguese I	4 s.h.
38:2 Elementary Portuguese II	4 s.h.
or	
38:100 Accelerated Portuguese	0-5 s.h.
38:11 Intermediate Portuguese I	4 s.h.
38:12 Intermediate Portuguese II	4 s.h.

Required Courses

38:105 Brazilian Literature I	3 s.h.
38:106 Brazilian Literature II	3 s.h.
38:107 Introduction to Portuguese Literature	3 s.h.
38:114 Culture and Civilization of the Portuguese-Speaking World	3 s.h.
38:122 Topics in Portuguese Language (upper-division language)	3 s.h.

Two of these (6 s.h.):

38:112 Topics in Luso-Brazilian Literature	3 s.h.
38:119 Topics in Portuguese Linguistics	3 s.h.
38:121 Portuguese for the Professions (upper-division language)	3 s.h.

Electives: other courses in the above group or other nonregular offerings in Portuguese (seminars, conversation); approved courses in related areas (e.g., art, anthropology,

comparative literature, geography, history, Latin American studies, linguistics, sociology) 6 s.h.

Minor in Portuguese

A minor in Portuguese requires 15 semester hours of course work in Portuguese with a minimum grade-point average of 2.00, 12 of which must be taken at The University of Iowa or in a University of Iowa foreign study program in courses numbered 100 and above.

Courses for Undergraduate Nonmajors

Undergraduate students in other disciplines may meet part of the College of Liberal Arts General Education Requirements in humanities and foreign civilization and culture with 35:20 Contemporary Latin American Narrative and 38:20 Contemporary Brazilian Narrative, in which the readings are in English. The department offers several other literature, film, and cultural survey courses that are taught in English and are of general interest.

Latin American Studies Certificate

The department plays an important and active role in the Latin American Studies Program, an interdisciplinary undergraduate program focusing on the history, politics, social organization, economy, art, and literature of Latin America. Work in the program leads to a certificate or minor in Latin American studies.

To receive the certificate, students must have sufficient competence in Spanish or Portuguese to do background readings in the language before enrolling in the required senior seminar. For further information on the Latin American Studies Program, see "Latin American Studies Program" in this section of the *Catalog*.

Graduate Programs

Master of Arts in Spanish

Candidates for the M.A. degree must have completed the equivalent of the undergraduate Spanish major with at least a 3.00 grade-point average in course work for the major. Deficiencies may be remedied with the appropriate course work.

The following course work is required.

35:200 Foreign Language Teaching Methods	3 s.h.
Spanish Language and Linguistics (200 level)	6 s.h.
Spanish literature	6 s.h.
Spanish-American literature	6 s.h.

Fifteen semester hours of elective courses at the 200 level or the advanced 100 level, no more than 6 semester hours of which may be taken outside the department; the required minimum is 36 semester hours for the M.A. program.

Maximum Study Loads

Maximum course registration is 15 graduate semester hours during fall or spring semesters and 8 graduate semester hours during summer sessions. One-quarter- and one-third-time teaching assistants are permitted to register for the maximum study loads. One-half-time teaching assistants may register for not more than 12 semester hours in fall or spring semesters, and for not more than 6 semester hours during summer sessions. Additional semester hours may be taken only with Graduate College approval.

Transfer Credit

A maximum of 9 semester hours of graduate credit in approved courses may be transferred from other institutions toward the 36-semester-hour requirement for the M.A. degree.

Teaching Certification

Exclusive of the student-teaching requirement, graduate students may take the courses necessary for secondary teaching certification while completing M.A. requirements in the department.

Examinations

The M.A. comprehensive examination is administered in both written and oral parts. The written portion consists of a two-hour examination in each of the candidate's three areas; an oral examination follows, usually lasting one and one-half hours. The candidate may choose to be examined in one linguistics and two literature areas, one literature and two linguistics areas, or three literature areas. If more than one literature area is represented, at least one must be in Spanish literature and at least one must be in Spanish-American literature. One film area may be substituted for either a linguistics or literature area. The examining committee is composed of four departmental faculty members.

Doctor of Philosophy in Spanish

Two doctoral programs are available. The first is dedicated to Hispanic literatures. Before the comprehensive examination, candidates must complete the equivalent of three years of college-level study in another Romance language and become well-acquainted with its literature in limited areas of specialization (a Portuguese-Brazilian program is especially recommended); complete the equivalent of a year of college Portuguese; and complete the equivalent of one year of college-level study of another approved foreign language. This language must be Latin for those who will write the dissertation on a pre-1700 topic.

The second doctoral program provides for specialization in Spanish linguistics. Before taking the comprehensive examination, candidates must complete the equivalent of two years of college Latin, the equivalent of three years of college Portuguese, and the equivalent of two years of college-level study of a third approved foreign language.

Program I: Literature Track

The following course work is required.

M.A. courses or equivalent transfer credits	36 s.h.
A course in literary theory, 200 level or above	3 s.h.
Two 300-level seminars	6 s.h.
35:299 Thesis	3 s.h.

Eight elective courses at the 200 level or the advanced 100 level, no more than three (9 s.h.) of which may be taken outside the department, bringing the total semester hours to the required minimum of 72 in the Ph.D. program.

Program II: Linguistics Track

The following course work is required.

M.A. courses or equivalent transfer credits	36 s.h.

Department of Linguistics:

103:110 Articulatory and Acoustic Phonetics	3 s.h.
103:111 Syntactic Analysis	3 s.h.
103:112 Phonological Theory and Analysis	3 s.h.
103:121 Syntactic Theory	3 s.h.

Department of Spanish and Portuguese:

One course in advanced Spanish syntax	3 s.h.
One course in advanced Spanish phonology	3 s.h.
One course in comparative Romance linguistics	3 s.h.
One course in Spanish dialectology	3 s.h.
Two additional courses in linguistics (may be taken in the Department of Linguistics)	6 s.h.
Two 300-level seminars in Spanish linguistics	6 s.h.
35:299 Thesis	2 s.h.
Total semester hours required	74 s.h.

Ph.D. Qualifying Examination

All doctoral students are admitted conditionally to the Ph.D. program and must take a qualifying examination during their second semester of Ph.D. study. Upon satisfactory completion of the Ph.D. qualifying examination, students are admitted to the Ph.D. program on a regular basis.

The purpose of the Ph.D. qualifying examination is to assess a doctoral student's potential for scholarly research, abilities in analytical thinking and critical reasoning, and level of sophistication in literary or linguistic argumentation. The exam marks the formal occasion on which doctoral students begin to give intellectual

focus to their program of study. Because it affords opportunities for both student initiative and faculty advice in defining a doctoral student's academic goals, the Ph.D. qualifying examination is significant in preparing doctoral students to take the Ph.D. comprehensive examination and to write the Ph.D. dissertation.

The Ph.D. qualifying examination is administered in both written and oral parts and includes the following.

Written presentation and subsequent oral defense of a research paper.

Written analysis of a single text in Hispanic literature or a single problem in Spanish linguistics that is assigned to the candidate 30 minutes before a two-hour written examination. The text or problem selected is taken from a short reading list that has been previously agreed upon among the candidate and his or her examiners; or, in the case of a linguistics qualifying examination, the problem selected also may be taken from the range of the candidate's previous course work.

Oral examination on major literary or linguistic works with which the candidate may be expected to be familiar, either from reading lists or from previous course work.

Excluding preparation of the research paper and the 30 minutes of advance reflection on the text or problem presented to the candidates for analysis, the length of the written portion of the Ph.D. qualifying examination is two hours. The oral portion, which includes defense of the research paper, discussion of the written examination, and discussion of selected major literary or linguistic works, is usually one and one-half hours long. The examining committee for the Ph.D. qualifying examination is composed of five departmental faculty members.

Comprehensive Examination

The purpose of the Ph.D. comprehensive examination is to determine whether the candidate has gained sufficient breadth and depth of research knowledge in Hispanic literatures or in Spanish linguistics to enter the profession as a teacher-scholar.

The Ph.D. comprehensive examination is administered in both written and oral parts. The written portion consists of a three-hour examination in each of four areas, detailed below; an oral examination follows, usually lasting two hours. The examining committee is composed of five departmental faculty members.

The four examination areas for each track are as follows.

Literature Track

A broad area in Spanish literary history; a reading list is determined by the student and his or her advisory committee.

A broad area in Spanish-American literary history; a reading list is determined by the student and his or her advisory committee.

Two specialized areas of the candidate's choosing. These areas might involve further and more specialized exploration of particular periods, genres, or movements within Spanish, Spanish-American, and/or Luso-Brazilian literary and cultural history; or they might involve in-depth study of specific problems in Hispanic literary criticism or in literary theory. Areas involving Latin American cinema also may be included. The candidate is given wide latitude in formulating the reading lists for these areas according to his or her research and teaching interests.

Linguistics Track

Contemporary Spanish syntax; a reading list is determined by the student and the advisory committee.

Contemporary Spanish phonology; a reading list is determined by the student and the advisory committee.

History of the Spanish language; a reading list is determined by the student and the advisory committee.

One specialized area of the candidate's choosing. This area might involve exploration of a specialized topic in one of the three core areas listed above; or it might involve study of a particular topic in comparative Romance philology, Spanish dialectology, Portuguese linguistics, comparative Spanish-Portuguese linguistics, applied linguistics (e.g., second language acquisition, languages in contact, sociolinguistics), or linguistic theory. The candidate is given wide latitude in formulating the reading list for this area according to his or her research and teaching interests.

Financial Aid

Teaching and research assistantships are available to qualified graduate students. Usually, two years of support are available for the completion of a master's degree, and three years beyond the receipt of the M.A. for the Ph.D. As long as graduate students' studies and performance meet departmental standards, they will continue to receive support over a reasonable period of time, but usually not for more than six years. Students who want financial support should apply directly to the departmental office.

Facilities

The Language Media Center provides facilities for language learning, teaching, and research. These include standard and shortwave radios, tape recorders, record players, soundproof recording rooms, two drill rooms with 68 dual-channel tape recorders providing a simultaneous master duplicate and student record, an electronic classroom, a soundproof workroom, 16mm and 8mm projection equipment and facilities, videocassette players and monitors, and a library of tape, videotape, and disc recordings. The department offers its majors a specific course in language laboratory procedures.

Courses

Spanish—Primarily for Undergraduates

All students are strongly urged to take the Spanish Placement Test, which is offered at regular intervals on campus. In the absence of test results, undergraduate students who have had less than two years of high school study in Spanish are placed in a first- or second-semester class. Students with two or more years of high school Spanish are placed in a third- or fourth-semester class. Prospective and entering students should consult a departmental adviser. Students who want more advanced placement must take the placement test. Transfer students who have taken college Spanish at other institutions will be placed according to previously completed courses.

Students may not, except with the department chair's approval, take an elementary course for credit after having completed a higher-level course for which the elementary course or its equivalent is a prerequisite.

35:000 Cooperative Education Internship **0 s.h.**

35:1 Elementary Spanish I **4 s.h.**
Introduction to the Spanish language; emphasis on oral and written comprehension; conducted in Spanish. GER: foreign language.

35:2 Elementary Spanish II **4 s.h.**
Continuation of 35:1; emphasis on oral and written skills. GER: foreign language. Prerequisite: 35:1 or equivalent.

35:3 Accelerated Elementary Spanish **6 s.h.**
Accelerated course covering the same material presented in 35:1 and 35:2; for students who have shown a strong ability in second-language learning. GER: foreign language.

35:4 Intensive Elementary Spanish **6 s.h.**
Complete first-year course. Offered only summer sessions. Consent of instructor required. GER: foreign language.

35:7 Intensive Elementary Reading in Spanish **3 s.h.**
Beginning course primarily for graduate students who want a reading knowledge of Spanish. Does not satisfy foreign language requirements. Offered through Guided Correspondence Study.

35:8 Spanish for Health Professionals I **3-4 s.h.**
Intensive conversation course to acquaint students with basic vocabulary used when dealing with Spanish-speaking patients; emphasizes speaking proficiency; students also become familiar with sociocultural aspects of Hispanic people. GER: foreign language. May be taken in place of 35:1 to satisfy foreign language requirements.

35:9 Spanish for Health Professionals II **4 s.h.**
GER: foreign language. Prerequisite: 35:1 or 35:8.

35:11 Intermediate Spanish I **3-4 s.h.**
Review of grammar learned in first-year Spanish; emphasis on development of oral and written communicative skills; conducted in Spanish. GER: foreign language. Prerequisite: 35:2 or equivalent.

35:12 Intermediate Spanish II **3-4 s.h.**
Continuation of 35:11. GER: foreign language. Prerequisite: 35:11 or equivalent.

35:13 Accelerated Intermediate Spanish **6 s.h.**
Accelerated course covering the same material presented in 35:11 and 35:12; for students who have shown strong ability in second-language learning. GER: foreign language. Consent of instructor required. Prerequisite: 35:2 or equivalent.

35:20 Contemporary Latin American Narrative **3 s.h.**
Primary focus on themes and narrative techniques in the

major texts of the decade 1960-70; an overview of cultural and sociopolitical aspects; conducted in English; readings in English. GER: foreign civilization and culture, humanities. Prerequisite: 8G:1.

35:25 Spanish Pronunciation **3 s.h.**
Designed for undergraduate nonnative speakers of Spanish who wish to fine-tune their pronunciation; practical rather than technical approach is followed, emphasizing students' particular difficulties. Prerequisite: 35:12 or equivalent. Corequisite: 35:106.

35:30 Spanish Conversation Junior Level **2 s.h.**

35:35 Spanish Conversation Senior Level **2 s.h.**

35:53 Special Work **1-3 s.h.**
Faculty signature is required.

Spanish—for Undergraduates and Graduates

35:100 Regents Hispanic Institute **arr.**
For courses taken in Regents Study Abroad Program in Burgos, Spain.

35:101 Accelerated Elementary Spanish **0-4 s.h.**
Complete first-year course. Open to graduate students.

35:102 Accelerated Intermediate Spanish **0-4 s.h.**
See 35:13. Open only to graduate students. Prerequisite: 35:2 or equivalent.

35:105 Language Teaching Practicum **1-3 s.h.**
A practical approach to dual language instruction; students are placed in small elementary-level classes where bilingual and ESL methodology is employed. Offered satisfactory/fail only. May be repeated.

35:106 Spanish Pronunciation **2 s.h.**
Designed for graduate nonnative speakers of Spanish who wish to fine-tune their pronunciation; a practical rather than technical approach is followed, emphasizing students' particular difficulties. Prerequisites: 35:12 or equivalent, and graduate standing. Corequisite: 35:25.

35:107 Advanced Spanish Language **4 s.h.**
Further develops students' understanding and use of Spanish by clarifying points of grammar and vocabulary still troublesome to English speakers at this level. Prerequisite: 35:12 or equivalent.

35:108 Problems in Spanish Grammar **3 s.h.**
Introduction to word structure and sentence formation in both languages, with attention to areas where the Spanish construction diverges from the English one; recommended for bilinguals or native Spanish speakers seeking greater insights into English grammar, for future teachers of Spanish or of English as a second language, and for others with an interest in comparing two linguistic systems. Prerequisite: 35:107 or equivalent.

35:109 Senior Spanish Language I **4 s.h.**
Stresses syntactic and lexical aspects; builds vocabulary and expands knowledge of the structure of the Spanish language. Prerequisite: 35:107 or equivalent.

35:110 Senior Spanish Language II **3 s.h.**
Stresses syntactic elements of the Spanish language and their underlying theory; some areas of syntax are studied in depth. Prerequisite: 35:109 or equivalent.

35:111 Introduction to Hispanic Linguistics **3 s.h.**
Prerequisite: 35:107 or equivalent.

35:112 Spanish Phonology **3 s.h.**
Covers articulatory description and phonetic transcription of Spanish sounds, and how these individual sounds are interrelated. Prerequisite: 35:107 or equivalent.

35:113 Structure of the Spanish Language **3 s.h.**
Introduction to linguistic analysis of Spanish in terms of generative grammar, focusing on morphology (word formation), syntax (sentence construction) and semantics (meaning analysis), and their interrelationship in an explanatory system. Prerequisite: 35:111.

35:114 Topics in Spanish Syntax **3 s.h.**
Several areas covered in depth to provide theoretical explanations underlying Spanish grammatical usage; extensive practice exercises demonstrate and reinforce theories presented in class. Prerequisite: 35:107 or equivalent.

35:115 Methods: Foreign Language **3 s.h.**
Emphasizes teaching foreign language in secondary schools; includes study of methods and materials demonstration, practice of teaching techniques, and organizing teaching. Prerequisite: 35:109 or equivalent. Same as 9:150, 13:120, 20:119, 78:116.

35:117 Topics in Foreign Language Instructional Technology **2 s.h.**
Concepts for the development of technology-based materials for foreign language instruction; topics may include computer authoring languages, interactive media, and language laboratory methods and management. Same as 13:123, 9:158.

35:118 Business Spanish **3 s.h.**
A fourth-year-level Spanish language course designed to introduce the language of the business world; emphasizes business correspondence and other documents essential to international trade. Prerequisite: 35:107 or equivalent.

35:121 Pedagogical Applications of Linguistics **3 s.h.**
Introduction to the linguistic basis for producing teaching materials; provides an opportunity to work with and produce materials used in the classroom, language laboratory, computer, and on television.

35:122 History of the Spanish Language **3 s.h.**
Changes in the vulgar Latin period, effect of the Visigoths and the Moors, the sound changes of the Siglo de Oro; words and word families showing the changes in sound and form that developed from classical latin to modern Spanish. Prerequisite: 35:111 or equivalent.

35:128 Creative Writing in Spanish: Chicano Poetics **1-3 s.h.**

35:129 Intensive Elementary Spanish **4 s.h.**

35:130 Spanish-American Civilization **3 s.h.**
Pre-Columbian, colonial, and modern periods studied with regard to socioeconomic structure, form of government, culture.

35:131 Contemporary Spanish-American Fiction **3 s.h.**
Main twentieth-century short-story writers and novelists of Spanish America (Asturias, Borges, Cortázar, Fuentes, García-Márquez, etc.) studied through representative works. Prerequisite: 35:12 or equivalent.

35:132 Spanish-American Poetry I **3 s.h.**
Introduction to poetry as a literary genre; short history of its development; early forms in Spanish America; poets from Modernism to the present, with readings from such writers as Rubén Darío, Pablo Neruda, César Vallejo, Octavio Paz, and J.L. Borges.

35:133 Spanish-American Drama **3 s.h.**
Introduction to and a short history of the theater; study of the leading Spanish-American dramatists of the twentieth century, including Florencio Sánchez, Villaurrutia, Usigli, René Marqués, Cuzzani, Egon Wolff, Vodanorió, and Jorge Díaz.

35:134 Spanish-American Short Story **3 s.h.**
Selections from nineteenth- and twentieth-century Spanish-American male and female writers; emphasis on reading strategies, historical, cultural, and literary backgrounds.

35:135 Contemporary Latin American Novel and Short Story **3 s.h.**
Survey of contemporary Latin American narrative, including works of Borges, Cortázar, Rulfo, and Márquez.

35:136 Contemporary Latin American News Colloquium **2 s.h.**
Same as 130:120.

35:138 Survey of Twentieth-Century Puerto Rican Literature **3 s.h.**
Social, cultural, and literary developments in Puerto Rico from 1898; role of Puerto Rican diaspora in literature and "Newyorican" writing in context; island and mainland authors.

35:139 Spanish-American Poetry II **3 s.h.**

35:140 Mass Communication in Spanish America **3 s.h.**
Nature of the communicative process in Spanish America and the United States; conceptualizations of mass communication and democratic communication systems; Spanish-language video and film.

35:141 Narrative: Film and Novel **3 s.h.**

35:142 Introduction to Latin American Studies **3 s.h.**
Contemporary issues and problems facing Latin American and Spanish-speaking U.S. populations; questions of cultural identity and survival; Spanish-language video and film.

35:145 Latin American Cinema Survey **3 s.h.**
Same as 36B:156.

35:146 Fiction as History **3 s.h.**
Same as 48:153.

35:147 National Cinemas of Latin America **3 s.h.**
Same as 36B:154.

35:150 Spanish Civilization **3 s.h.**
Political, religious, social, and economic background of Spanish culture; important cultural and literary movements of Spanish history.

35:151 Renaissance and Golden Age Literature **3 s.h.**
Study and analysis of representative works of the Golden Age of Spanish prose, drama, and poetry. Prerequisite: 35:12 or equivalent.

35:152 Modern Spanish Literature **3 s.h.**
The most important trends of Spanish literature from Romanticism to the generation of 1927. Prerequisite: 35:12 or equivalent.

35:153 Representative Writers Since the Civil War **3 s.h.**
Intellectual and historical background; important cultural and literary movements; impact of World War II on Spanish literature. Selections from essays, novels, short stories, poetry, and drama.

35:155 Terminology and Institutions of Hispanic Law: A Comparative Approach **3 s.h.**
Historical, conceptual, and cultural introduction to the legal systems of Spain and Latin America; basic training in Spanish legal vocabulary and Hispanic civil law institutions; lectures and readings in Spanish and English.

35:156 Readings in Hispanic Literature **3 s.h.**

35:157 Survey of Spanish Literature I **3 s.h.**

35:158 Survey of Spanish Literature II **3 s.h.**

35:159 Hispanic Fiction to Film **3 s.h.**
Four major literary works, as written, as film: García Lorca's *Bodas de sangre*, Mérimée's *Carmen*, Delibes' *Los santos inocentes*, and Puig's *Beso de la mujer araña*.

35:160 Invitation to Modern Spanish Poetry **3 s.h.**
Basic Hispanic versification and rhetorical terminology; introduction to the key poetic works of Gustavo Adolfo Bécquer, Rubén Darío, Antonio and Manuel Machado, Juan Ramón Jiménez, and Federico García Lorca.

35:170 Literature of the Discovery and Conquest of Spanish America **3 s.h.**
Cultural and historical antecedents of the discovery and conquest of Spanish America recorded in the chronicles and epic poems of the sixteenth century.

35:173 Images of Women in Hispanic Literature **3 s.h.**
Major influences in forming the image of women in Spanish-American and Peninsular Spanish writing, emphasizing the role of traditional psychoanalysis and more recent feminist interpretations; selections by women and men; discussion of contemporary feminist movement in Spain and Spanish America.

35:174 Topics in Chicano-Puerto Rican Studies **3 s.h.**
In-depth treatment of specific topics related to Chicanos and Puerto Ricans in the United States; topics vary. May be repeated.

35:175 Cultural Identity in Caribbean Literature **3 s.h.**
Main currents in twentieth-century Hispanic Caribbean literature: *americanismo literario, poesía negra*, testimonial narrative centered on slavery and women's fiction; exploration of Caribbean cultural context in music, choteo, and Afro-Cuban rituals. Same as 48:160.

35:176 Latin American Studies Seminar **3 s.h.**
Topics vary according to instructor. Same as 38:159, 113:132.

35:177 Periods and Genres of Spanish-American Literature I 3 s.h.
Structured survey of major periods, genres, and movements in Spanish-American literature before 1914. Recommended for seniors and M.A. students.

35:178 Periods and Genres of Spanish-American Literature II 3 s.h.
Structured survey of major periods, genres, and movements in Spanish-American literature after 1914. Recommended for seniors and M.A. students.

35:179 Testimonial Literature in Latin America 3 s.h.
Analysis of concept of the *testimonio*, or *socioliteratura*, in Latin America narrative; issues of genre, authorial function, social context, and reception of texts; discussion of ideology and subjectivity.

35:180 Spanish Golden Age Fiction 3 s.h.
Study and analysis of works representing different narrative modes in Golden Age fiction: *Lazarillo de Tormes, El Abencerraje, Amadís de Gaula, La Diana*, and some of Cervantes' *Exemplary Novels*.

35:181 Spanish Golden Age Poetry and Drama 3 s.h.
Representative works of Golden Age poetry and drama in Spanish Renaissance and Baroque culture. Prerequisite: 35:107.

35:182 Spanish Picaresque Literature 3 s.h.
Lazarillo de Tormes, Guzmán de Alfarache (selections), *El Buscón, El Lazarillo* of Juan de Luna, and *El Coloquio de los Perros*; read and analyzed in light of the most recent criticism. Prerequisite: 35:107.

35:184 Twentieth-Century Spanish Women Writers 3 s.h.
Close reading and analysis of selected short stories, novels, and journalistic writings of authors such as Carmen Laforet, Ann María Matute, Ester Tusquets, Montserrat Roig, Lidia Falcón, Carmen Alcalde, Mercé Rodoreda, and others.

35:185 Contemporary Spain 3 s.h.
Interdisciplinary and multimedia study of twentieth-century Spain; significant aspects of Spanish history and culture from the Civil War to the present through televisual, cinematic, historiographical, and literary texts.

35:187 Periods and Genres of Spanish Literature I 3 s.h.
Structured survey of major periods, genres, and movements in Peninsular literature before 1700. Recommended for seniors and M.A. students.

35:188 Periods and Genres of Spanish Literature II 3 s.h.
Survey of literary works representing the major genres and movements in Peninsular literature from 1700 to the present. Recommended for seniors and M.A. students.

35:190 Chicano Cinema 3 s.h.

35:191 National Cinema: Cuba 3 s.h.

35:197 Honors: Spanish Language 2-3 s.h.
Individual studies in language at the upper-undergraduate level (beyond 35:109); students are assigned term papers in a Spanish language problem. Open only to honors students.

35:198 Honors: Spanish Literature 2-3 s.h.
Individual studies in literature at the upper-undergraduate level (beyond 35:109); students are assigned term papers on a Spanish literature theme. Open only to honors students.

35:199 Special Work 1-3 s.h.
Faculty signature required.

Spanish—Primarily for Graduates

35:200 Foreign Language Teaching Methods 3 s.h.
Bibliographical tools, resources, and professional organizations; comparison of first- and second-language acquisition; language proficiency versus language achievement in the four skills; history/overview of methods; techniques (small-group work, error correction, drills); equipment (overheads, video, computers); teaching difficult grammar areas.

35:203 Topics in Graduate Spanish Language 3 s.h.
In-depth study of Spanish phonetics and phonology; introduction to modern linguistic analysis applied to selected topics in Spanish syntax; students compile an extensive bibliography on some aspect of Spanish language to serve as the basis for a research paper.

35:204 Graduate Spanish Linguistics 3 s.h.
Theory-oriented study of selected topics of Spanish syntax with extensive practice in application of the theories presented. Prerequisite: 35:203 or equivalent.

35:205 Historical Ibero-Romance Language I 3 s.h.
Study of phonology and morphology from Latin to modern Spanish focusing on development from vulgar Latin to Old Spanish, Old Spanish to Golden Age, and Golden Age to modern Spanish. Same as 103:260.

35:206 Historical Ibero-Romance Language II 2 s.h.
Continued study of morphology; development of syntax from Latin to modern Spanish; treatment of spread and change of Spanish over the centuries; effects of substratum and superstratum languages. Same as 103:261.

35:207 Comparative Romance Linguistics 3 s.h.
Overview of comparisons of phonology, morphology, syntax, and lexicon of the main Romance languages, in historical and present-day perspective; some linguistic theory and Latin. Same as 9:250, 20:201, 103:262.

35:208 Advanced Study of Spanish Language Structure 3 s.h.
In-depth graduate-level study of topics in contemporary Spanish syntax, on both theoretical and applied levels.

35:209 Advanced Spanish Phonology 3 s.h.

35:210 Advanced Spanish Syntax 3 s.h.
In-depth presentation of theoretical aspects of Spanish syntax; includes ample practice in exercises designed to illustrate the theories presented.

35:215 Advanced Spanish-English Translation 3 s.h.
Translation into English of Spanish colloquial, literary, journalistic, and technical texts. Open only to graduate and advanced upper-division Spanish majors.

35:217 Introduction to Contemporary Literary Theory 3 s.h.

35:220 Spanish Dialectology 3 s.h.

35:221 Spanish-American Dialectology 3 s.h.
Basic issues of Spanish-American dialectology: regional and social dialects, dialect zones, peninsular dialect base, indigenous influences, with emphasis on syntax; theory and practical application through analysis of representative corpus of Spanish-American speech.

35:230 Spanish-American Romanticism 3 s.h.
Beginnings of Spanish-American national literatures; the decisive function of romanticism; the first great era of Spanish-American literature and the beginnings of the modern period.

35:231 Spanish-American Essayists and Thinkers 3 s.h.
Study of the nineteenth-century reformers and their efforts to create an independent Spanish-American consciousness; outstanding contemporary Spanish-American problems.

35:232 Spanish-American Drama 3 s.h.
Study of Spanish-American theater from the pre-Columbian era up to and emphasizing contemporary theater.

35:233 Spanish-American Poetry of the Twentieth Century 3 s.h.
Study of the principal works of Spanish-American vanguard poets and of the characteristics of their poetry; includes Vicente Huidobro, César Vallejo, Pablo Neruda, Jorge Luis Borges, Octavio Paz, and Nicanor Parra.

35:240 Spanish-American Novel 1900-1935 3 s.h.
Period 1900-1935; search for a unique image of America; naturalistic documentation and poetic vision of the reality of America; the "exemplary novels"; other highlights of literary Americanism.

35:242 Spanish-American Novel: The Boom 3 s.h.
Period following 1962; study of the main currents of nonrealism; disintegration of narrative and of reality; study of all important contemporary developments in the novelistic genre.

35:243 Post-Boom Narrative in Spanish America 3 s.h.
Study of the contemporary novel in Spanish America and its radical critique of realism; historical narrative and other traditional novelistic forms; critical topics from discussion of post-boom narrative in Spanish America and its link to a postmodernist aesthetic; as basis for analyzing contemporary narrative, Mikhail Bakhtin's theories of parody and the carnivalesque and the polyphonic novel developed in *Problems of Dostoevsky's Poetics* and *The Dialogic Imagination* are studied.

35:244 Short Story in Spanish America 3 s.h.
Development of genre and context of literary movements; writings from Argentina, Peru, Chili, Uruguay, Cuba, Mexico, Columbia, Puerto Rico; comparison with themes and forms of U.S. short stories.

35:245 Spanish-American Short Story of Fantasy 3 s.h.
Examines theories of Tzvetan Todorov and Irène Bessière on literature of fantasy; diachronic study of literature of fantasy, from Juan Montalvo's "Gaspar Blondín" to the work of Bioy Casares and Julio Cortázar; other authors studied include Rubén Darío, L. Lugones, A. Nervo, J.L. Borges, A. Carpentier, C. Fuentes, C. García Márquez.

35:246 Images of Woman in Latin American Literature 3 s.h.
Analysis of narrative works by major twentieth-century Latin American women writers; examines cognitive frameworks implicit in these works and the works of selected male writers and critics through studying the philosophical and psychological currents that have shaped this literature's ideological stance.

35:247 Readings: Latin American History arr.
Study of the questions that have preoccupied major Latin American intellectuals (*pensadores*) in the nineteenth and twentieth centuries, such as constitutional organization, the secularization of society, the colonial heritage, race and nationality, the Indian, "Latin democracy," cultural identity, social revolution, and economic dependency and development. Same as 16:288.

35:248 Cuban Film Culture 3 s.h.

35:253 Lyric Poetry of the Golden Age 3 s.h.
Study and stylistic analysis of representative poetic texts of the great Renaissance and Baroque poets: Garcilaso de la Vega, Fray Luis de León, San Juan de la Cruz, Góngora, Lope de Vega, and Quevedo.

35:254 Drama of the Golden Age 3 s.h.
Main dramatists and representative works of Spain's rich drama of the Renaissance; pre-Lope de Vega period through Calderón de la Barca.

35:257 Cervantes' Don Quixote 3 s.h.
Careful reading of Cervantes' *Don Quixote* in the context of the history of narrative literature.

35:258 Nineteenth-Century Spanish Novel 3 s.h.
Significant novels, literary schools, and movements of the nineteenth century.

35:260 Generation of 1898 3 s.h.
History and literature of the generation of 1898; detailed study of works by Ganivet, Unamuno, Azorín, Baroja, Maeztu, Machado, Valle Inclán, Benavente, and Menéndez Pidal.

35:261 Twentieth-Century Spanish Poetry 3 s.h.
Principal poets and their works from 1900 to the present.

35:262 Jiménez, García Lorca, and the Generation of '27 3 s.h.
In-depth analysis of the poetry and poetic theory of Juan Ramón Jiménez, Federico García Lorca, Rafael Alberti, Pedro Salinas, and Jorge Guillén.

35:263 Twentieth-Century Spanish Drama 3 s.h.
Principal playwrights and trends to present day; works by Benavente, García-Lorca, Casona, Buero Vallejo, Sastre, and others.

35:265 Spanish Novel 1898-1939 3 s.h.
Principal figures and trends from the generation of 1898 to the Civil War period, 1936-1939.

35:266 Spanish Novel 1939-Present 3 s.h.
Principal figures and trends from the post-Civil War period to the present.

35:268 Spanish Humanism I 3 s.h.

35:270 Latin American Cinema History 3 s.h.
Same as 36B:270.

35:275 Advanced Film Theory 3 s.h.

35:280 Intellectual Backgrounds of Literary Periods 3 s.h.
Intellectual history and its relation with literary history; classical tradition in Spanish literature; the mind of the Middle Ages and its expression in literature; crisis of the

twentieth century; humanism and literature; Renaissance and literature; Reformation, counter-reformation and its reflection in literature; Baroque and Spanish literature; cultural basis of romanticism; cultural foundation of realism.

35:281 Introduction to Contemporary Literary Theory **3 s.h.**
Major currents in contemporary literary theory and how these theories construct the literary text; structuralist, semiotic, psychoanalytic, Marxist, reader response, feminist, and deconstructive criticism. Same as 48:217, 8:277.

35:283 Literary Polemics in Spanish America **3 s.h.**

35:284 Types of Modern Criticism **3 s.h.**
Systematic study of one of several contemporary literary theories, such as semiotics, Marxist literary theory, deconstruction, and feminism; topics vary. Same as 8:284, 48:284.

35:285 Subjectivity, Discourse, and the Social Body **3 s.h.**

35:298 Special Work **arr.**
Consent of instructor required.

35:299 Thesis **arr.**

35:300 Seminar: Linguistics **3 s.h.**
Same as 103:300.

35:301 Seminar: Spanish-American Narrative **3 s.h.**

35:302 Seminar: Spanish-American Poetry **3 s.h.**

35:303 Seminar: Spanish-American Theater **3 s.h.**

35:304 Seminar: Spanish Medieval Literature **3 s.h.**
Intensive critical study of topics and genres.

35:305 Seminar: Spanish Golden Age Literature **3 s.h.**
Intensive critical study of topics and genres.

35:306 Seminar: Nineteenth-Century Spanish Literature **3 s.h.**
Topics vary.

35:307 Seminar: Twentieth-Century Spanish Literature **3 s.h.**
Topics vary.

35:308 Seminar: Structure of the Literary Work **3 s.h.**

35:309 Seminar: Problems in Literary Theory **3 s.h.**

35:310 Seminar: Lexicology and Dialectology **3 s.h.**

Portuguese

38:1 Elementary Portuguese I **4 s.h.**
Speaking and comprehending basic Portuguese; incorporating cultural materials; oral communication and written exercises; language lab required. GER: foreign language.

38:2 Elementary Portuguese II **4 s.h.**
Continuation of 38:1; additional oral work drawn from Brazilian and Portuguese texts. GER: foreign language. Prerequisite: 38:1 or equivalent.

38:11 Intermediate Portuguese I **4 s.h.**
Building reading, discussion, and writing skills; grammar review. GER: foreign language. Prerequisite: 38:2 or equivalent.

38:12 Intermediate Portuguese II **4 s.h.**
Continuation of 38:11. GER: foreign language. Prerequisite: 38:11 or equivalent.

38:20 Contemporary Brazilian Narrative **3 s.h.**
Introduces students to a variety of works (novels, short stories, other narrative forms) beginning with the neorealists of the 1930s; examines the cultural background of different periods, and the innovative literary approaches of the writers through films and other media. GER: foreign civilization and culture, humanities.

38:53 Special Work **arr.**
Consent of instructor required.

38:100 Accelerated Portuguese **0-5 s.h.**
Introduction to the language of Brazil, primarily for students with prior experience in other foreign languages; training in comprehending, speaking, reading, and writing modern Brazilian Portuguese, emphasizing speaking. GER: foreign language.

38:105 Brazilian Literature I **3 s.h.**
Introduction to the literature of Brazil from its beginnings through the close of the nineteenth century; representative readings from all periods and genres, emphasizing works of major Brazilian authors such as Gonzaga, Alencar, Castro Alves, Machado de Assis, and Cruz e Sousa; conducted in Portuguese.

38:106 Brazilian Literature II **3 s.h.**
Survey of twentieth-century Brazilian poetry, novels, and short stories; modernism, regionalism, the generation of '45, and concretism, as well as works of the principal figures behind these movements; focuses on such major writers of the modern period as Lima Barreto, Mario de Andrade, Drummond, Jorge Amado, Cabral de Melo Neto, Guimarães Rosa, and Lispector; conducted in Portuguese.

38:107 Introduction to Portuguese Literature **3 s.h.**
Representative readings including Portuguese lyric and epic poetry, Renaissance theater, romantic and realist novels, twentieth-century symbolist verse and neorealist prose; special attention to contemporary writers of postrevolutionary Portugal; conducted in Portuguese.

38:112 Topics in Luso-Brazilian Literature **3 s.h.**
Specific genres, themes, and/or movements in Luso-Brazilian literature. May be repeated for credit when topics vary. Prerequisite: 38:106 or 35:107 or consent of instructor.

38:114 Culture and Civilization of the Portuguese-Speaking World **3 s.h.**
Introduction to modern Brazil, Portugal, Angola, and Mozambique through examining historical background, socioeconomic and political structures, culture, and literature of the various ethnic and national groups; conducted in English.

38:119 Topics in Portuguese Linguistics **3 s.h.**
Portuguese phonology, syntax, sociolinguistics, first- and second-language acquisition, Portuguese-English bilingualism, and the relationship of language and culture, with practical application to language pedagogy, translation, international studies, and anthropology. Consent of instructor required. Same as 103:119.

38:121 Portuguese for Professions **3 s.h.**
Practical application of oral and written Portuguese to law, medicine, business, and teaching with appropriate usage and vocabulary; oral and written projects. Prerequisite: 38:12 or consent of instructor.

38:122 Topics in Portuguese Language **3 s.h.**
Refinement of oral and written language ability through new vocabulary groups, appropriateness of language use, stereotyped phrases, levels of formality, and problematic grammar points. Prerequisite: 38:12 or consent of instructor.

38:156 Intensive Intermediate Portuguese **0-3 s.h.**
A complete second-year course. Prerequisites: 38:2 or equivalent, and graduate standing.

38:159 Latin American Studies Seminar **3 s.h.**
Offered by cooperating Latin American studies departments; topics vary. Same as 35:176, 113:132.

38:179 Special Work **1-3 s.h.**
Consent of instructor required.

38:278 Special Work **arr.**
Consent of instructor required.

SPEECH PATHOLOGY AND AUDIOLOGY

Chair: John W. Folkins
Professors: Paul J. Abbas, John W. Folkins, James C. Hardy, Erich S. Luschei, Kenneth L. Moll, Hughlett L. Morris, Arnold M. Small, Jr., Ingo R. Titze, J. Bruce Tomblin, Richard S. Tyler, Duane R. Van Demark
Professors emeriti: James F. Curtis, Duane C. Spriesterbach, Dean E. Williams
Associate professors: Charles V. Anderson, Richard R. Hurtig, Chaslav V. Pavlovic, Donald A. Robin
Assistant professors: Ruth A. Bentler, Jill L. Elfenbein, Penelope K. Hall, Katherine Verdolini-Marston, Amy L. Weiss, Patricia M. Zebrowski
Adjunct associate professors: Fariborz Alipour-Haghighi, Herbert N. Jordan, Linda S. Jordan, Gerri Kahn, Ronald C. Scherer, Robert L. Schum, Gerald N. Zimmermann
Adjunct assistant professors: Carolyn J. Brown, Dorothea B. Edwards, Charles R. Felling, David L. Jones, Francis K. Kuk, Charissa R. Lansing, Jerald B. Moon, Adrienne L. Perlman, Nancy A. Tye-Murray
Clinical staff in instruction: Toni D. Cilek, Cynthia C. Fix, Anne K. Gay, Janet P. H. Getta, Patricia M. Hendryx, Linda S. Jordan, Diane P. Niebuhr, Robert L. Schum
Clinical associates in practicum instruction: Mary E. Becker, Jean Madsen Beisler, LeAnn F. Boehne, Barbara A. Brady, Jacqueline F. Bryant, Jean A. Goematt, Patricia D. Keesee, Judith M. Knabe, Mary W. Lowder, Susan G. Lynn, Joan Marttila, Elizabeth B. Merrifield, Mary K. Mills, Cynthia K. Nicholson, Carol L. Nordquist, M. Colleen Picek, Sandra D. Show, Marcia Simpson, Diane M. Spicknall, Myrna M. Stephens, M. John Synstelien, Lynn K. Tiemann, Rebecca R. Vilda
Undergraduate degrees offered: B.A., B.S. in Speech and Hearing Science
Graduate degrees offered: M.A., Ph.D. in Speech Pathology and Audiology

The courses and degree programs of the Department of Speech Pathology and Audiology are planned to meet the needs of students preparing for careers such as clinical service, college and university teaching, and research concerned with speech, language, or hearing processes and disorders. The department also offers courses for students with vocational and professional goals in other fields—for example, engineering, psychology, education, speech, theater arts, dentistry, and medicine—whose preparation may be enriched by the study of speech and hearing processes and their disorders.

Advanced degree holders in this field provide clinical services for people with speech, hearing, or language problems in hospitals, community clinics, rehabilitation facilities, elementary and secondary schools, and private practice. They teach in colleges and universities and conduct research in laboratories concerned with communication processes and disorders.

All professional programs of the department leading to the M.A. degree are accredited by the Educational Standards Board of the American Speech-Language-Hearing Association.

Undergraduate Programs

Since the master's degree or its equivalent is the minimum level of preparation for persons seeking professional careers in this field, the undergraduate curricula leading to B.S. or B.A. degrees in speech and hearing science do not qualify an individual to work professionally in the field, but primarily prepare students for graduate work instead. Hence, the undergraduate programs emphasize the normal processes of speech, hearing, and language. These undergraduate programs also may be taken by students earning College of Liberal Arts degrees who do not want careers in this field.

Requirements

The B.S. or B.A. degree in speech and hearing science requires a minimum of 30 semester hours. The required courses are as follows:

3:15 Introduction to Speech and Hearing Processes and Disorders	3 s.h.
3:112 Fundamentals of Speech Science	1-4 s.h.
3:113 Introduction to Hearing Science	1-4 s.h.
3:117 Psychology of Language	1-4 s.h.
3:118 Language Development	3 s.h.
7P:143/22S:102 Introduction to Statistical Methods	3 s.h.
or	
7P:25 Elementary Statistics and Inference	3 s.h.
31:1 Elementary Psychology	3 s.h.
or	
31:3 General Psychology	4 s.h.
103:110 Articulatory and Acoustic Phonetics	3 s.h.

Group A

One of the following:

17:108 Basic Aspects of Aging	3 s.h.
31:13 Introduction to Clinical Psychology	3 s.h.
31:105 Personality	3 s.h.
31:116 Psychology of Sex Differences	3 s.h.
31:163 Abnormal Psychology	3 s.h.
34:130 Aging and Society	3 s.h.
42:184 Multidisciplinary Perspectives on Aging	3 s.h.
113:136 Aging: A Cross-Cultural Perspective	3 s.h.

Group B

One of the following:

Courses marked with an asterisk (*) are preferred:

*31:14 Introduction to Child Psychology	3 s.h.
31:103 Development of Children's Social Behavior	3 s.h.
31:110 Learning and Motivation in Children	3 s.h.
*31:114 Cognitive Development of Children	3 s.h.
*17:10 Growth and Development of the Young Child	3 s.h.
*7P:106 Child Development	3 s.h.
31:166 Developmental Psychopathology	3 s.h.
31:170 Behavior Modification	3 s.h.

Students seeking a bachelor's degree also must complete or have had the equivalent of college algebra and trigonometry, college physics dealing with light and sound, and a college course in the biological sciences.

Students have the opportunity and are encouraged to obtain 25 hours of supervised clinical observation, a prerequisite for clinical practicums. This requirement is satisfied by completion of independent observations or required observations made for elective departmental courses.

Honors

The senior-year program leading to the B.A. or B.S. degree with honors in speech and hearing science is open to students who at the beginning of their senior year have completed at least 10 semester hours of course work that can be counted toward a major in the department, and have earned at least a 3.20 grade-point average in all major course work and all course work at the University.

At any time during their undergraduate study, students who have earned a minimum grade-point average of 3.20 and who did not enter the University as honors students may apply to the College of Liberal Arts Honors Program and the department's honors program upon recommendation of the departmental honors adviser. For graduation with honors, the student must be classified as an honors student in the College of Liberal Arts and must complete both 3:97 Honors Seminar and 3:98 Honors Thesis.

Graduate Programs

Master of Arts

The M.A. program in speech-language pathology and audiology may be a professional program to prepare the student for immediate placement in clinical service positions, or it may be a general program of graduate study leading to additional study for the Ph.D. degree. The program of study for an M.A. with professional emphasis is designed to ensure that upon graduation the student will meet the requirements for immediate professional employment.

M.A. candidates usually have a background of undergraduate courses in speech and hearing science, psychology of language, and human behavior essentially equivalent to an undergraduate major in this field at The University of Iowa.

Before first registering in the program, entering M.A. degree candidates are interviewed by faculty members who teach basic course work in speech, hearing, and language. These interviews are used to determine students' background in areas considered prerequisite to graduate study. They provide students and faculty advisers with information on background course work to be incorporated into the plan of study.

The M.A. program with professional emphasis prepares clinicians in speech-language pathology or audiology who are able to function independently in a variety of clinical settings. Persons completing an M.A. program with professional emphasis meet all academic and practicum requirements for clinical certification by the American Speech-Language-Hearing Association and for licensure by the state of Iowa.

The M.A. degree requires a minimum of 38 semester hours of graduate credit.

All M.A. students must complete at least 4 semester hours of research registration. This may be accomplished by any combination of enrollment in seminars (at 2 semester hours each) and/or research hours. Completion of the research hours registration may consist of work toward a thesis or preparation of a paper involving one or a combination of the following: literature review, prospectus development, and presentation of data. A paper is required at the end of each semester's enrollment. An exception to this requirement can be made in the case of research hours leading to a thesis.

Candidates for an M.A. degree with professional emphasis are not required to complete a thesis, although all students demonstrating research aptitude and interest are encouraged to do so. All candidates preparing for the M.A. degree without thesis are required to take final written comprehensive examinations.

A typical M.A. program with professional emphasis is two years in length but may be longer or shorter depending on the student's background and personal interests.

M.A. with Research Emphasis (General Program)

The general M.A. program for the student intending to continue to the Ph.D. degree usually includes a substantial portion of the courses in the professional M.A. program. Students in the general M.A. program also are required to present a thesis and successfully complete a final oral examination.

M.A. with Professional Emphasis

Core Requirements

All students seeking an M.A. with professional emphasis must take the following.

*3:116 Neural Processes of Speech and Language	3 s.h.
*3:135 Principles of Assessment	1-3 s.h.
*3:136 Principles of Intervention	1-3 s.h.
3:140 Manual Communication I	1 s.h.
*3:145 Speech-Language Pathology I: Phonological Disorders, Developmental Language Disorders, and Stuttering	1-3 s.h.
*3:146 Speech-Language Pathology II: Neurological Disorders, Voice Disorders, Cleft Palate, and Related Disorders (speech-language pathology majors only)	1-3 s.h.
*3:185 Hearing Loss and Audiometry	4 s.h.
3:244 Rehabilitative Audiology	4 s.h.
3:300 Professional Practice of Audiology and Speech-Language Pathology	0 s.h.

*3:100 Counseling Theories and Techniques 3 s.h.
or
*7C:199 Counseling for Related Professions 3 s.h.

3:510 Seminar: Introduction to Research in Speech and Hearing 0 s.h.
Advanced seminars or research 4 s.h.
Additional semester hours of practicum registration sufficient to meet supervised, direct clinical experience requirements for the Certificate of Clinical Competence of the American Speech-Language-Hearing Association and Iowa license, and to provide broad supervised practicum experience

*An equivalent undergraduate course may be accepted as meeting requirements.

All students preparing to be speech-language pathologists must take a minimum of 14 semester hours from the following.

3:182 Phonological Development and Disorders 2 s.h.
3:183 Stuttering 2 s.h.
3:201 Principles of Voice Production 3 s.h.
3:202 Methods of Teaching Voice 3 s.h.
3:206 Speech and Language Disorders of Young Children: Birth to Five Years 2 s.h.
3:207 Speech and Language Disorders of Older Children: Five to Eighteen Years 2 s.h.
3:208 Communication Problems of Developmental Disorders and Disabilities 2 s.h.
3:212 Voice Disorders 2 s.h.
3:213 Voice Training and Rehabilitation 2 s.h.
3:215 Developmental Apraxia of Speech 2 s.h.
3:221 Instrumentation for Voice Analysis 2 s.h.
3:231 Communication Problems Associated with Head and Neck Cancer 1 s.h.
3:233 Neurogenic Disorders of Language 2 s.h.
3:234 Neurogenic Disorders of Speech 2 s.h.
3:236 Dysphagia 1 s.h.
3:237 Cleft Palate and Related Disorders 2 s.h.
3:260 Computer-aided Technology for Assistive Communication Systems 1-3 s.h.
3:350 Preceptorship in Augmentative Communication 1 s.h.
3:375 Issues and Methods of Clinical Research 3 s.h.
3:530 Seminar: Communication Disorders and Aging 2 s.h.
7E:104 Remedial Methods in Speech and Hearing 2 s.h.
49:125 Voice for the Actor 3 s.h.

Students training to become speech-language pathologists may elect to follow one of three specialty tracks: schools, hospitals and health agencies, and vocology. Two of the tracks provide an especially strong preparation for students preparing to work in specific settings. The schools track offers preparation for speech-language pathologists in preschools, elementary schools, and secondary schools. The hospitals and health agencies track prepares students for work as speech-language pathologist in hospitals, small clinics, and other health-care settings. And the vocology track prepares specialists in disorders of the voice, with emphasis on disorders of professional voice users, such as singers, actors, and lecturers.

The requirements and recommended electives for each track are listed below. In addition, practicum experiences are structured to fit the needs of students within each track.

School Track

Required

3:182 Phonological Development and Disorders 2 s.h.
3:183 Stuttering 2 s.h.
3:206 Speech and Language Disorders of Young Children: Birth to Five Years 2 s.h.
3:207 Speech and Language Disorders of Older Children: Five to Eighteen Years 2 s.h.
7E:104 Remedial Methods in Speech and Hearing 2 s.h.

Total 10 s.h.

Recommended

3:208 Communication Problems of Developmental Disorders and Disabilities 2 s.h.
3:215 Developmental Apraxia of Speech 2 s.h.
3:260 Computer-aided Technology for Assistive Communication Systems 1-3 s.h.
3:350 Preceptorship in Augmentative Communication 1 s.h.

Hospital and Health Agencies Track

Required

3:212 Voice Disorders 2 s.h.
3:231 Communication Problems Associated with Head and Neck Cancer 1 s.h.
3:233 Neurogenic Disorders of Language 2 s.h.
3:234 Neurogenic Disorders of Speech 2 s.h.
3:237 Cleft Palate and Related Disorders 2 s.h.

Total 9 s.h.

Recommended

3:182 Phonological Development and Disorders 2 s.h.
3:183 Stuttering 2 s.h.
3:208 Communication Problems of Developmental Disorders and Disabilities 2 s.h.
3:215 Developmental Apraxia of Speech 2 s.h.
3:236 Dysphagia 1 s.h.
3:260 Computer-aided Technology for Assistive Communication Systems 1-3 s.h.
3:350 Preceptorship in Augmentative Communication 1 s.h.

Vocology Track

Required

3:201 Principles of Voice Production 3 s.h.
3:212 Voice Disorders 2 s.h.
3:213 Voice Training and Rehabilitation 2 s.h.
3:221 Instrumentation for Voice Analysis 2 s.h.

Total 9 s.h.

Recommended

3:183 Stuttering 2 s.h.
3:202 Methods of Teaching Voice 3 s.h.
3:231 Communication Problems Associated with Head and Neck Cancer 1 s.h.
3:234 Neurogenic Disorders of Speech 2 s.h.
3:237 Cleft Palate and Related Disorders 2 s.h.
49:125 Voice for the Actor 3 s.h.

Audiology Requirements

All students preparing to become audiologists must take:

3:120 Fundamentals of Laboratory Instrumentation 3 s.h.
3:140 Manual Communication I 1 s.h.
3:240 Clinical Audiology and Hearing Aids I 4 s.h.
3:241 Advanced Audiology 3 s.h.
3:242 Clinical Audiology and Hearing Aids II 4 s.h.
3:245 Pediatric Audiology 2 s.h.
Additional practicum, research, and elective courses

Students planning to work as audiologists in a school setting must take 7E:104 Remedial Methods in Speech and Hearing along with appropriate practicum experiences.

Requirements for Employment

A number of states, including Iowa, require a state license in speech-language pathology or audiology for persons who work in settings other than the public schools. Students who meet the requirements listed above for the M.A. degree with professional emphasis also meet the academic requirements for the license in Iowa, as well as in most other states.

Public School Certification

Students preparing for clinical positions in public schools must meet certification requirements of the states in which they plan to work. The following criteria meet the certification requirements for endorsement as speech-language pathologists or school audiologists in Iowa and most other states.

- A master's degree with professional emphasis in speech-language pathology or audiology.
- Completion of the requirements in speech-language pathology or audiology and the professional education sequence,

including 7E:104 Remedial Methods in Speech and Hearing and student teaching/internship as a speech-language pathologist or audiologist. Courses in the following areas may be recognized for meeting the professional education sequence:

Curriculum (e.g., reading, methods, curriculum development);

Foundations (e.g., philosophy of education, foundations of education);

Educational measurement (e.g., tests and measurements, measures and evaluations of instruction);

Educational psychology (e.g., educational psychology, counseling theories and techniques);

Special education (e.g., introduction to special education, exceptional persons, learning disabilities); and

Child development (e.g., human growth and development, principles and theories of child development, history and theories of early childhood education).

General education courses (e.g., introduction to psychology, sociology, history, literature, and humanities) are not credited as meeting the professional education sequence.

- Completion of an approved human relations component.

- Completion of courses that cover the education of the handicapped and the gifted and talented (e.g., exceptional persons, education of the gifted).

Doctor of Philosophy

The Ph.D. program provides flexible, comprehensive training for the scholar-researcher interested in communication processes and their disorders. Students with diverse backgrounds in the natural and behavioral sciences are encouraged to apply and develop their skills in an atmosphere of interdisciplinary research.

The program reflects the broad interests and diverse backgrounds of the faculty. Workers in speech, language, hearing, engineering, physiology, physics, psychology, linguistics, and bioengineering are committed to an interdisciplinary approach to questions at every level of the speech and language production/perception system. The purpose of the doctoral program is to provide the integrated knowledge necessary for a productive career in the field of speech-language pathology and audiology, communication science, and related areas.

The department encourages candidates with special interests, goals, or backgrounds to develop individualized programs of study. There are no required courses for the Ph.D. degree; rather, a program of study is developed by each student in consultation with a faculty committee. The course of study is developed from the courses offered in this department, those in other areas (e.g., physics, engineering, psychology, mathematics, statistics, physiology, neurology, anatomy, and others), and special reading and research experiences.

The courses offered by this department primarily for the Ph.D. student include the following (students interested in the specific areas of research and selected publication citations of the faculty are encouraged to write the department directly).

3:120 Fundamentals of Laboratory Instrumentation	3 s.h.
3:201 Principles of Voice Production	3 s.h.
3:216 Language Acquisition	3 s.h.
3:218 Psycholinguistics	3 s.h.
3:220 Advanced Laboratory Instrumentation	3 s.h.
3:224 System and Signal Theory for Speech and Hearing Sciences	3 s.h.
3:230 Speech Perception	3 s.h.
3:250 Acoustics and Biomechanics of Speech	5 s.h.
3:252 Physiology of Speech Production	5 s.h.
3:254 Psychoacoustics	3 s.h.
3:255 Psychoacoustics Laboratory	4 s.h.
3:256 Physiology of Hearing	4 s.h.
3:258 Digital Signal Processing	2 s.h.
3:375 Issues and Methods of Clinical Research	3 s.h.
3:515 Proseminar	0 s.h.
3:520 Seminar: Developmental Language Disorders	2 s.h.
3:521 Seminar: Stuttering	2 s.h.
3:523 Seminar: Voice	2 s.h.
3:525 Seminar: Cleft Palate	2 s.h.
3:526 Seminar: Rehabilitative Audiology	2 s.h.
3:528 Seminar: Neuropathologies of Speech and Language	2 s.h.
3:530 Seminar: Communication Disorders and Aging	2 s.h.
3:532 Seminar: Speech Science	2 s.h.
3:533 Seminar: Psycholinguistics	2 s.h.
3:535 Seminar: Psychoacoustics	2 s.h.
3:536 Seminar: Experimental Audiology	2 s.h.
3:537 Seminar: Clinical Audiology	2 s.h.
3:538 Seminar: Auditory Physiology	2 s.h.
3:590 Research	arr.

Students in the Ph.D. program usually are expected to register for research credit during each semester of residence and to register for and participate in 3:515 Proseminar.

Knowledge in each of the areas of hearing, speech, language, mathematics, statistics, computer science, and instrumentation is required of all students. Decisions regarding the extent of this knowledge and how it is obtained (e.g., course work or independent study) are made jointly by the student and the student's faculty committee.

Doctoral students who have not written a master's thesis must complete the equivalent of a master's thesis project as well as the comprehensive examination. They also must successfully complete and submit a dissertation based on original research.

Admission and Appointments

The Department of Speech Pathology and Audiology has requirements for admission and graduate appointments that supplement those specified by the Graduate College. A brief summary of the requirements is presented below. More detailed information is available from the department chair.

Application Form

All applicants for admission to graduate study in the Department of Speech Pathology and Audiology must complete the departmental information form, which can be obtained from the department chair.

Admission to the M.A. Program

The department bases M.A. admission on applicants' credentials relative to those presented by other applicants for the same term. While an undergraduate grade-point average above 3.00 does not ensure admission, the department admits few applicants with undergraduate grade-point averages below 3.00.

Completed applications must be received no later than February 1 for enrollment in the next summer session or fall semester. Later applications will be considered only in special situations. Applications to begin study in the spring semester will be considered only under special circumstances and only if they are received no later than the preceding November 1.

Admission to the Ph.D. Program

Completed applications should be received at least two months prior to the beginning of the term for which application is made: approximately April 1 for summer session, July 1 for fall semester, November 1 for spring semester. However, applicants who want to be considered for graduate appointments must file the admission application by the deadline for appointment applications specified below. Applicants usually are notified of action on their admission within six weeks after applications are complete.

Application for Graduate Appointments

The following information applies to all financial appointments administered by the department.

- Graduate appointments usually begin only in fall semester. Students beginning study in the spring semester or summer session are considered for appointments for the following fall semester.

- Scores on the Graduate Record Examination (GRE) General Test are routinely required for consideration for financial assistance.

• Appointment applications must be received by February 1 to ensure consideration for an appointment beginning the following fall semester.

• Initial appointment offers are generally made between April 1 and June 1; however, the department continues to make offers after this time.

Clinical Facilities

The clinical training program benefits greatly from the fact that Iowa City is the principal health center of the state and from the ready availability of its health service facilities for the clinical training of students in speech-language pathology and audiology.

The University of Iowa Affiliated Speech and Hearing Services include The Wendell Johnson Speech and Hearing Clinic; the division of speech and hearing in the Department of Otolaryngology—Head and Neck Surgery; Speech Pathology Service in the Department of Neurology; Speech and Hearing Services, University Hospital School; Pediatrics Regional Child Health Specialty Clinics; Speech Pathology Service, Child Psychiatry; and Audiology and Speech Pathology, Veterans Affairs Medical Center. Directors of these programs form the Council on Speech Pathology and Audiology at The University of Iowa.

The Wendell Johnson Speech and Hearing Clinic serves the University and the general public. Included in its services are outpatient evaluation and rehabilitation programs for speech, hearing, and language problems, and a six-week summer residential program for children. These clinical programs give students supervised clinical experience with a wide variety of speech, hearing, and language disorders.

In addition to the clinical training in the Wendell Johnson Speech and Hearing Clinic, training also may be acquired in supervised clinical practice with elementary school children by arrangement with the various state area education agencies; and in supervised clinical practice in speech and hearing services provided by the Departments of Otolaryngology—Head and Neck Surgery, Pediatrics, and Neurology, the Regional Child Health Specialty Clinics, University Hospital School, Veterans Affairs Medical Center, and St. Luke's Methodist Hospital in Cedar Rapids.

Public and private departments and programs in addition to those mentioned above often contribute to the cooperative professional training, research, and service programs.

Research Facilities

Facilities in the Wendell Johnson Speech and Hearing Center include audiometric testing suites, diagnostic and remediation suites, equipment for diagnosis and therapy, a closed-circuit television system, and laboratories and equipment for acoustic, physiologic, and perceptual studies of speech, and for audiologic, psychoacoustic, and neurophysiologic studies of hearing. Mechanical and electronic shops and trained technical personnel are available for assistance in research instrumentation.

Cooperation of various departments of The University of Iowa Hospitals and Clinics and the College of Dentistry makes additional laboratory facilities available for research on problems in speech and hearing. The participation and cooperation of specialists from various fields, including psychology, child development, education, engineering, statistics, and medicine, further broaden the scope of research activities in speech and hearing.

Courses

3:000 Speech Pathology and Audiology Cooperative Education Assignment **0 s.h.**
Cooperative internships administered by the Cooperative Education Program are filled on a competitive basis by eligible students. Prerequisites: faculty approval, satisfactory completion of Cooperative Education Program requirements, and consent of the Cooperative Education Program.

3:15 Introduction to Speech and Hearing Processes and Disorders **3 s.h.**
Speech, language, and auditory behavior as fields of scientific study; description of major types of speech, hearing, and language disorders.

3:30 Introduction to Professional Practice in Audiology and Speech-Language Pathology **0 s.h.**
Topics in the general practice of audiology and speech-language pathology. May be repeated. Open only to departmental majors with junior standing or above.

3:97 Honors Seminar **3 s.h.**
Readings, reports, preparation of papers, and discussion of research problems in speech-language pathology and audiology. Open only to honors students. Offered satisfactory/fail. Offered fall semesters.

3:98 Honors Thesis **3 s.h.**
Preparation of major paper focusing on a research problem in speech-language pathology and audiology. Open only to honors students. Offered satisfactory/fail. Offered spring semesters. Prerequisite: 3:97.

3:99 Topics in Hearing, Language, and Speech Processes and Disorders **1 s.h.**
Contemporary issues in the study of speech, language, and hearing processes and disorders; clinical management of these disorders. Consent of instructor required.

3:100 Counseling Theories and Techniques **3 s.h.**
Introduction to counseling and psychological theories as they relate to adjustment and management of communication disorders; emphasis on integration of theory with specific techniques to facilitate clinical success. Offered fall semesters. Consent of instructor required.

3:112 Fundamentals of Speech Science **1-4 s.h.**
Anatomy of the speech production apparatus; physiologic and acoustic characteristics of speech; principles and methods for the laboratory study of speech. Offered spring semesters. Prerequisite: 103:110 or consent of instructor.

3:113 Introduction to Hearing Science **1-4 s.h.**
Normal auditory process; acoustics, anatomy, physiology of the auditory system; subjective correlates of auditory stimulus. Offered every fall semester and summer sessions of even years.

3:116 Neural Processes of Speech and Language **3 s.h.**
Basic anatomy and physiology of the central nervous system; emphasis on neural systems involved in normal and disordered communication. Offered spring semesters. Prerequisite: course in biology, zoology, or physiology; or consent of instructor. Same as 103:177.

3:117 Psychology of Language **1-4 s.h.**
Theoretical and empirical investigations of linguistic behavior; behaviorist and rationalist models discussed in context of formal linguistic structure as well as context of the models of speech perception and production. Offered spring semesters. Same as 103:172.

3:118 Language Development **1-3 s.h.**
Alternative models of language acquisition; examination of the empirical data describing language development from its prelinguistic roots through later development in adolescence. Offered fall semesters. Same as 103:176.

3:120 Fundamentals of Laboratory Instrumentation **3 s.h.**
Introduction to basic electrical and electronic circuits and their applications in speech and hearing science; laboratory sessions provide familiarity with measurement techniques, circuit construction, and signal generation and processing. Offered fall semesters.

3:124 Describing Children's Language Performance **2 s.h.**
Approaches to describing and analyzing language behavior of children; emphasis on approaches to data collection and descriptive taxonomies. Offered fall semesters. Prerequisite: 3:118.

3:135 Principles of Assessment **1-3 s.h.**
Basic concepts of psychological measurement, their application to assessment of communication disorders; fundamental methods of observing and testing speech and language performance in children and adults. Prerequisites: 3:15 and 103:110, or consent of instructor.

3:136 Principles of Intervention **1-3 s.h.**
Theoretical underpinnings of speech and language treatment procedures provided by speech-language pathologists; historical perspective and current issues in management of individuals with speech and language disorders; focus on commonalities among intervention methods regardless of disorder. Prerequisites: 3:15 and 103:110, or consent of instructor.

3:140 Manual Communication I **1 s.h.**
Training in use of sign systems in manual communication. Offered only satisfactory/fail.

3:141 Manual Communication II **1 s.h.**
Introduction to and appreciation of American Sign Language and deaf culture. Offered only satisfactory/fail. Prerequisite: 3:140.

3:143 Introduction to American Sign Language **4 s.h.**
Basic American Sign Language manual communication skills including vocabulary, syntax, and grammar; psychosocial and cultural ramifications of deafness. Offered only through Saturday and Evening Class Program.

3:145 Speech-Language Pathology I: Phonological Disorders, Developmental Language Disorders, and Stuttering **3 s.h.**
Nature of phonological disorders, developmental language disorders, stuttering; behavioral characteristics, developmental patterns, theories of etiology; basic concepts. Prerequisites: 3:15 and 103:110, or consent of instructor.

3:146 Speech-Language Pathology II: Neurogenic Disorders, Voice Disorders, Cleft Palate, and Related Disorders **1-3 s.h.**
Nature of neurologically based speech and language disorders, disorders of the voice, disorders related to craniofacial anomalies such as cleft palate; behavioral characteristics and theories of etiology; basic concepts. Prerequisites: 3:15 and 103:110. Pre- or corequisite: 3:116 or consent of instructor.

3:165 Communication Disorders and Aging **2 s.h.**
Introduction to speech, language, and hearing processes and disorders among older adults; survey of characteristics of communication and communication breakdown, remediation, and strategies for improving communication with older adults with communication disorders; primarily for nonmajors and service providers other than speech/language pathologists and audiologists. Offered summer sessions of odd years.

3:176 Introduction to Speech and Hearing Processes and Disorders **3 s.h.**
See 3:15.

3:182 Phonological Development and Disorders **2 s.h.**
Development of the child's phonological system; theoretical bases and normative data support; assessment of disordered sound systems in both child and adult populations; intervention procedures for speech sound disorders. Lab registration is required. Offered spring semesters. Prerequisite: 103:110 or consent of instructor.

3:183 Stuttering 2 s.h.
Research and theory of stuttering behavior, causes, developmental factors, remedial procedures. Offered fall semesters and summer sessions of odd years. Prerequisite: 3:15 or consent of instructor.

3:185 Hearing Loss and Audiometry 4 s.h.
Introduction to and survey of audiology with emphasis on basic audiometry and clinical masking. Offered fall semesters. Pre- or corequisite: 3:113.

3:186 Problems: Speech Pathology arr.
Offered only satisfactory/fail. Consent of instructor required.

3:187 Problems: Audiology arr.
Offered only satisfactory/fail. Consent of instructor required.

3:201 Principles of Voice Production 3 s.h.
Basic physical, physiological, and pedagogical principles involved in understanding professional, nonprofessional, impaired voice production; vocal anatomy, voice classification, loudness control, pitch, register, quality; efficient, inefficient use of voice; instrumentation for voice analysis, synthesis. Offered every fall semester and summer sessions of even years. Same as 25:201.

3:202 Methods of Teaching Voice 3 s.h.
Comparison of pedagogical techniques of voice training; attitude assessment, language aptitude, physical, emotional characteristics; mental images modifying respiratory, phonatory, articulatory behavior; vocal hygiene; performance anxiety; student-teacher relationships. Offered every spring semester and summer sessions of odd years. Consent of instructor required. Same as 25:202.

3:206 Speech and Language Disorders of Young Children: Birth to Five Years 2 s.h.
Disorders resulting from phonological, semantic, pragmatic, and morphosyntactic deficits; receptive and expressive problems; assessment and intervention procedures; field observations of preschool-age children receiving speech and language intervention. Prerequisites: 3:135, 3:136, 3:145 and 3:146; or consent of instructor.

3:207 Speech and Language Disorders of Older Children: Five to Eighteen Years 2 s.h.
Predominant patterns of language impairment in children and adolescents; approaches to clinical management with emphasis on language skills needed for educational success. Prerequisites: 3:135, 3:136, 3:145 and 3:146; or consent of instructor.

3:208 Communication Problems of Developmental Disorders and Disabilities 2 s.h.
Nature and clinical management of communication problems of children and adults with mental retardation, pervasive developmental disorders, and cerebral palsy. Prerequisites: 3:135, 3:136, 3:145 and 3:146; or consent of instructor.

3:212 Voice Disorders 2 s.h.
Diagnostic assessment, therapy procedures and rationales for clinical intervention; voice rehabilitation following surgical alteration or removal of the vocal mechanism. Offered spring semesters. Prerequisite: 3:112. Recommended: 3:201.

3:213 Voice Training and Rehabilitation 2 s.h.
Application of methods of intervention in the development, training, rehabilitation of vocal behavior; motor learning, efficacy of treatment strategies, factors affecting compliance with recommended therapy. Prerequisites: 3:201 and 3:212; or consent of instructor.

3:214 Developmental Language Disorders 3 s.h.
Principal issues and research concerning the nature of developmental language disorders, as well as assessment and treatment of such disorders. Offered spring semesters. Prerequisite: 3:118.

3:215 Developmental Apraxia of Speech 2 s.h.
Description, assessment, remedial techniques. Prerequisites: 103:110, 3:145 and 3:182; or consent of instructor.

3:216 Language Acquisition 3 s.h.
Detailed examination of theoretical and empirical issues of children's acquisition of language; relation of language development to perceptual and cognitive development; research projects provide experience in child language research. Offered fall semesters of odd years. Consent of instructor required.

3:218 Psycholinguistics 3 s.h.
Detailed examination of theoretical and empirical issues in psycholinguistics; models demonstrating the relation of formal language structure to psychological operations utilized in speech perception and production; laboratory projects provide familiarity with paradigmatic research in psycholinguistics. Offered fall semesters of even years. Consent of instructor required. Same as 103:218.

3:220 Advanced Laboratory Instrumentation 3 s.h.
Laboratory sessions provide familiarity with circuit construction, power supplies, amplification, signal generation, switching and timing, magnetic tape recorders, transducers. Offered spring semesters of odd years. Consent of instructor required. Prerequisite: 3:120 or equivalent.

3:221 Instrumentation for Voice Analysis 2 s.h.
Use of glottographic, videostroboscopic, electromyographic, aerodynamic, and acoustic analysis for assessment of vocal and respiratory function; use of these techniques in conjunction with perceptual evaluation of voice. Prerequisite: 3:201 or consent of instructor.

3:224 System and Signal Theory for Speech and Hearing Sciences 3 s.h.
Review of basic calculus; differential equations, convolution, and system functions; application of these principles of linear-systems theory to speech and auditory research. Offered spring semesters. Prerequisite: introductory calculus.

3:230 Speech Perception 3 s.h.
Classical and contemporary theories of speech perception; perception in auditory, visual, and tactile modalities. Offered spring semesters. Prerequisites: background in phonetics, speech science, and hearing science; or consent of instructor.

3:231 Communication Problems Associated with Head and Neck Cancer 1 s.h.
Voice rehabilitation following surgical alteration or removal of the vocal mechanism; principles of clinical intervention for other types of head and neck cancer. Prerequisites: 3:135, 3:136, 3:145 and 3:146; or consent of instructor.

3:233 Neurogenic Disorders of Language 2 s.h.
Assessment and treatment of language and cognitively based communication disorders in adults associated with disease, trauma, and abnormalities of the nervous system. Prerequisites: 3:116, 3:135, 3:136, 3:145, 3:146, 3:182 and 3:207; or consent of instructor.

3:234 Neurogenic Disorders of Speech 2 s.h.
Assessment and treatment of disorders of speech production in adults associated with disease, trauma, and abnormalities of the nervous system; laboratory required. Prerequisites: 3:116, 3:135, 3:136, 3:145, 3:146, 3:182 and 3:212; or consent of instructor.

3:236 Dysphagia 1 s.h.
Physiology of normal and abnormal swallowing; assessment and treatment of swallowing disorders. Prerequisites: 3:135, 3:136, 3:145 and 3:146; or consent of instructor.

3:237 Cleft Palate and Related Disorders 2 s.h.
Nature, etiologies, principles of treatment of common disorders associated with cleft lip and palate and associated disorders. Offered fall semesters. Prerequisite: 3:182 or equivalent.

3:240 Clinical Audiology and Hearing Aids I 4 s.h.
Introduction to hearing aids and diagnostic procedures; supervised laboratory sessions provide familiarity with measurement procedures. Offered fall semesters. Prerequisite: 3:185 or consent of instructor.

3:241 Advanced Audiology 3 s.h.
Current research and practice in audiology; topics may include physiologic measurement of hearing loss and vestibular function, occupational audiology, and evaluation of nonperipheral auditory problems. Offered fall semesters. Prerequisite: 3:240 or consent of instructor.

3:242 Clinical Audiology and Hearing Aids II 4 s.h.
Selection and evaluation strategies for hearing aids, cochlear implants, and vibrotactile devices; supervised laboratory sessions provide familiarity with devices and procedures. Offered spring semesters. Prerequisite: 3:240 or consent of instructor.

3:243 Hearing Aid Assembly and Repair 1-2 s.h.
Hands-on work with hearing aid components, fabrication of shells and earmolds, assembly of ITE hearing aids; repair of different types and models of hearing aids. Consent of instructor required.

3:244 Rehabilitative Audiology 4 s.h.
Theory and procedures for assessment and rehabilitation of the speech, hearing, and language deficits of people with hearing impairment. Offered fall semesters. Prerequisite: 3:185 or equivalent.

3:245 Pediatric Audiology 2 s.h.
Theory and procedures for assessment and rehabilitation of pediatric populations; supervised laboratory sessions provide familiarity with test administration. Offered spring semesters. Prerequisite: 3:185 or consent of instructor.

3:250 Acoustics and Biomechanics of Speech 5 s.h.
Sound generation, propagation, and radiation in human speech communication; acoustic phonetics; phonatory and articulatory mechanics; analysis, synthesis, and processing of speech; speech perception; emphasis on research techniques; includes supervised laboratory projects. Offered fall semesters of odd years. Prerequisites: 3:112 and 3:120, or consent of instructor. Same as 103:275.

3:252 Physiology of Speech Production 5 s.h.
Summarizes current information and theory on physiological bases of speech production; emphasis on research techniques; supervised laboratory projects. Offered spring semesters of odd years. Prerequisites: 3:112 and 3:120, or consent of instructor. Same as 103:277.

3:254 Psychoacoustics 3 s.h.
Lectures and discussions on advanced topics and current research in auditory sensation and perception. Offered spring semesters. Prerequisite: 3:113 or consent of instructor. Same as 31:271.

3:255 Psychoacoustics Laboratory 4 s.h.
Supervised laboratory experimentation; analysis of stimulus generation equipment; replication by students of classical psychoacoustic experiments. Offered spring semesters. Corequisite: 3:254 or consent of instructor. Same as 31:272.

3:256 Physiology of Hearing 4 s.h.
Lectures and discussion on structure and function of auditory system; includes anatomy of the peripheral auditory system, cochlear mechanics, and electrophysiology of both the peripheral and central nervous system; laboratory projects emphasize application of typical physiological techniques used in the study of the ear. Offered fall semesters. Prerequisite: 3:113 or consent of instructor.

3:258 Digital Signal Processing 2 s.h.
Hands-on experience with terminal-oriented computer instrumentation for signal analysis and synthesis; introduction to software for analog-to-digital conversion, digital filtering, spectrum analysis, auditory stimulus generation, and speech synthesis. Offered spring semesters. Consent of instructor required.

3:260 Computer-Aided Technology for Assistive Communication Systems 1-3 s.h.
System design, both hardware and software, useful in building augmentative and alternative communication devices for the profoundly impaired; opportunity to build systems for theoretical and/or applied purpose; interdisciplinary and clinical perspectives. Consent of instructor required.

3:300 Professional Practice of Audiology and Speech-Language Pathology 0 s.h.
Topics in the general practice of audiology and speech-language pathology. May be repeated. For professional M.A. students and all other students registered for practicum.

3:301 Practicum: Speech-Language Pathology arr.
Supervised clinical practice; practicum meetings in fall and spring. May be repeated. Consent of instructor required.

3:311 Practicum: Audiology arr.
Supervised clinical practice; practicum meetings in fall and spring. May be repeated. Consent of instructor required.

3:312 Practicum: Hearing Measurement arr.
Supervised clinical practice in the evaluation of individuals for hearing impairment and its impact; practicum meetings in fall and spring. May be repeated. Not open to professional M.A. audiology majors. Offered only satisfactory/fail. Consent of instructor required.

3:350 Preceptorship in Augmentative Communication 1 s.h.
Overview of approaches to the development of alternate modes of communication for individuals with limited oral communication; supplemented by demonstrations and practical projects. Consent of instructor required.

3:375 Issues and Methods of Clinical Research 3 s.h.
Major types of clinical research problems employed in the study of clinical populations or process; methods for evaluation of diagnostic and therapy procedures and for

studying properties of individuals or groups with communication disorders; methods include single- and multiple-subject designs such as longitudinal, family study, and questionnaire methods. Offered summer sessions. Prerequisite: 7P:243 or consent of instructor.

3:510 Seminar: Introduction to Research in Speech and Hearing **0 s.h.**
Informal discussions of the research process; starting project, using resources, seeking advice; review of research opportunities in the department. Offered fall semesters.

3:515 Proseminar **0 s.h.**
Presentation of research ideas and results by faculty and students.

3:517 Seminar: Counseling Techniques and Behavior Management **2 s.h.**
Counseling techniques used with communication-disordered persons and their families; topics include techniques of group counseling, cognitive behavior modification, management of common behavior problems among impaired children; efficacy of techniques evaluated by examining research on clinical applications.

3:518 Seminar: Adjustment to Communication Disorders **2 s.h.**
Patterns of adjustment to communication disorders in children and adults; factors that enhance positive coping and adjustment to common psychosocial problems; emphasis on review of research and methods for evaluating models of adjustment.

3:520 Seminar: Developmental Language Disorders **2 s.h.**
Intensive review of critical issues and research; phonological approaches to articulation disorders, single-subject designs in articulation, language remediation studies. May be repeated. Offered fall semesters and summer sessions. Prerequisite: 3:182 or consent of instructor.

3:521 Seminar: Stuttering **2 s.h.**
Intensive individualized study of theoretical issues and research literature. May be repeated. Offered every spring semester, and summer sessions of even years. Prerequisite: 3:183 or consent of instructor.

3:523 Seminar: Voice **2 s.h.**
Systematic study and critical review of research related to normal and disordered voice production and perception; topics include vocal abuse, fatigue, endurance; perceptual correlates of vocal pathologies; models of voice production; spasmodic dysphonia; assessment of voice improvement. May be repeated. Offered fall semesters. Prerequisite: 3:212 or equivalent.

3:525 Seminar: Cleft Palate **2 s.h.**
Intensive individualized study of theoretical issues and research literature. May be repeated. Offered summer sessions. Prerequisite: 3:237 or equivalent.

3:526 Seminar: Rehabilitative Audiology **2 s.h.**
Intensive individualized study of theoretical issues and research literature. May be repeated. Offered spring semesters.

3:528 Seminar: Neuropathologies of Speech and Language **2 s.h.**
Special topics in speech and language problems associated with neurological disorders; individualized study. May be repeated. Offered spring semesters. Consent of instructor required.

3:530 Seminar: Communication Disorders and Aging **2 s.h.**
Individualized study of special topics; for graduate students and practitioners in speech/language pathology and audiology; emphasis on application of gerontology to speech/language pathology and audiology. May be repeated. Offered summer sessions of even years. Consent of instructor required.

3:532 Seminar: Speech Science **2 s.h.**
Selected topics in research and theory related to acoustic, physiologic, and perceptual processes of speech. May be repeated. Offered summer sessions. Prerequisite: 3:250 or consent of instructor. Same as 103:370.

3:533 Seminar: Psycholinguistics **2 s.h.**
Perceptual processing and language, discourse theory, pragmatics/conversational competence, cognitive models of language; topics vary. May be repeated. Offered summer sessions. Consent of instructor required. Same as 103:320.

3:535 Seminar: Psychoacoustics **2 s.h.**
Intensive critical review of selected topics; may include temporal factors in detection, pitch perception, discrimination processes, binaural hearing and adaptation. May be repeated. Offered summer sessions of odd years. Prerequisite: 3:254 or consent of instructor.

3:536 Seminar: Experimental Audiology **2 s.h.**
Intensive individualized study of advanced topics and current research; topics include modeling of hearing impairment, speech perception by the hearing impaired, speech processing for cochlear implants, measurement of tinnitus, psychoacoustics of the hearing-impaired. May be repeated. Offered summer sessions. Prerequisite: 3:241 or consent of instructor.

3:537 Seminar: Clinical Audiology **2 s.h.**
Intensive individualized study of current topics; includes cochlear implants, vibrotactile aids, electrical response audiometry, tinnitus. May be repeated. Offered fall semesters. Prerequisite: 3:241 or consent of instructor.

3:538 Seminar: Auditory Physiology **2 s.h.**
Current topics; specific areas depend on interests of group. May be repeated. Offered spring semesters. Consent of instructor required.

3:545 Seminar: Supervision in Speech-Language Pathology and Audiology **2 s.h.**
Processes involved in supervision; emphasis on developing awareness of identifying and analyzing process components and their relationship to the supervisor/supervisee interaction; clinical supervision model for speech-language pathology and audiology across levels and environments presented as a tool for developing effective supervisory skills. Open only to students in second-year professional M.A. program or beyond. Consent of instructor required.

3:590 Research **arr.**
Consent of instructor required.

STATISTICS AND ACTUARIAL SCIENCE

See "Division of Mathematical Sciences."

THEATRE ARTS

Chair: Cosmo A. Catalano
Professors: Cosmo A. Catalano, David Thayer
Professors emeriti: Lewin Goff, David Schaal
Associate professors: Shelly Berc, Eric Forsythe
Assistant professors: Art Borreca, Mary Katherine Burke, Linda Roethke
Adjunct professor: Shirlee Dodge
Undergraduate degree offered: B.A. in Theatre Arts
Graduate degree offered: M.F.A. in Theatre Arts

Undergraduate Program

Bachelor of Arts

The major in theatre arts provides a liberal arts education and preparation for professional or educational work in the theatre. The B.A. degree provides a strong background in theatre art and dramatic literature with requirements and electives in the major interest areas of acting, design, directing, playwriting, and theatre history. The program provides ample opportunity for performance experience and workshop activities. Students who demonstrate special aptitude may participate in special emphasis programs in acting, design, directing, or playwriting.

Advising

Initial advising for theatre arts undergraduates is handled by a representative of the department. After a student has selected an area of interest, efforts are made to assign the student a faculty adviser in the chosen area. Students are not required to accept a particular adviser and may request a change at any time by consulting with the theatre arts administrative assistant. Faculty advisers also have this right of acceptance.

Preenrollment in many theatre arts courses requires a special permission signature, which should be obtained from the relevant faculty member, or from the theatre arts office, 107 Theatre Building.

Auditions

All theatre arts majors are required to audition in general auditions at the beginning of the fall semester. Students present a four-minute audition consisting of two contrasting pieces, one from material that is pre-1900. From this audition, call-back lists are posted for the subscription series productions for the first semester. Audition materials and information are available from the theatre arts office, 107 Theatre Building, in August. Notice of auditions for subsequent subscription series productions, ad hoc productions, and other acting opportunities are posted on the department's call board.

Degree Requirements

The following courses compose the basic experience for all undergraduate theatre arts majors. Students who can demonstrate readiness/proficiency for higher level work may seek permission for advanced standing by notifying their adviser. It is the responsibility of faculty in each interest area to set their own criteria for evaluation and to determine the student's qualification for advanced standing. Students who want to be considered for special emphasis programs must seek the guidance of the head of the appropriate program(s).

Minimum Requirements

Completion of a minimum of 27 semester hours, including the following courses, and a 2.00 grade-point average for all courses taken in the major are required.

*49:1 Art of the Theatre	3 s.h.
*49:21 Acting I	3 s.h.
*49:43 Elements of Design	3 s.h.
*49:60 Play Script Analysis	3 s.h.
49:91 Production (repeated for a total of 3 s.h.)	1 s.h.
49:108 Theatre History I	3 s.h.
49:2 Theatre and Society	3 s.h.
Two courses§ in dramatic literature	6 s.h.
Total	27 s.h.

*These courses are prerequisites for all advanced-level courses. Theatre arts majors must complete 3 semester hours of 49:91 by the end of their junior year.

Theatre Arts Laboratory

All theatre arts students, faculty, and staff meet each week for guest presentations, discussion, and theatre arts class presentations. Attendance by theatre majors is mandatory.

Special Emphasis Program Requirements

Students who have a special aptitude and readiness may seek admission to a special emphasis program. Admission is gained by consultation with the program head, who discusses the features of the emphasis and outlines its requirements. To remain in the emphasis, students must demonstrate their ability to progress satisfactorily through the requisite courses and maintain a 2.00 grade-point average in courses in the major. The emphasis culminates in a senior project presented to the faculty.

Acting Emphasis

Head of acting: Eric Forsythe

49:22 Acting II	3 s.h.
49:28 Basic Stage Combat	2 s.h.
49:125 Voice for the Actor	3 s.h.
49:126 Movement for the Actor	3 s.h.
49:121 Acting III	3 s.h.
49:122 Acting IV	3 s.h.
49:145 Stage Makeup	2 s.h.

Directing Emphasis

Head of directing: Eric Forsythe

49:118 Directing I	3 s.h.
49:119 Directing II	3 s.h.
49:22 Acting II	3 s.h.
49:114 Contemporary Theatre	3 s.h.
49:126 Movement for the Actor	3 s.h.
49:125 Voice for the Actor	3 s.h.
49:133 Stage Management	3 s.h.
49:28 Basic Stage Combat	2 s.h.

Design Emphasis

Head of design: David Thayer

49:43 Elements of Design	3 s.h.

Two of these (total 6 s.h.):

49:134 Scene Design I	3 s.h.
49:135 Costume Design I	3 s.h.
49:136 Lighting Design I	3 s.h.

One of these:

49:101, 49:111 Costume History I or II	3 s.h.
49:140-141 Historic Styles I or II	3 s.h.

One of these:

49:157 Advanced Scene Design	3 s.h.
49:158 Advanced Costume Design	3 s.h.
49:159 Lighting Design II	3 s.h.

One of these:

49:142 Drawing for Theatrical Design	3 s.h.
49:143 Rendering	3 s.h.
49:144 Scene Painting	3 s.h.
49:145 Stage Makeup	1-2 s.h.
49:146 Drafting I	3 s.h.

Final project: an independent advanced design project in area of specialization.

Playwriting Emphasis

Head of playwriting:

49:62 Basic Playwriting	3 s.h.
49:167 Advanced Playwriting	3 s.h.
49:22 Acting II	3 s.h.
49:118 Directing I	3 s.h.

Three of these (total 9 s.h.):

49:114 Contemporary Theatre	3 s.h.
49:119 Directing II	3 s.h.
49:162 The Serial	4 s.h.
49:163 Adaptation	3 s.h.
49:164 Playwriting for Other Media	3 s.h.
49:166 Dramaturgy	3 s.h.
49:169 Playwriting: The Docudrama	3 s.h.

Final project: a full-length play or its equivalent in shorter works. One five-minute scene must be staged for the faculty.

Transfer Students

Students who transfer to The University of Iowa from other accredited two- or four-year institutions must demonstrate that they have successfully completed course work equivalent to the basic requirements of the theatre arts department and the University before they may undertake advanced-level electives or seek admission to a special emphasis program.

Honors

The Honors Program entails the completion of an honors project under the supervision of a faculty member. Projects may be analytical or creative or an appropriate combination of the two. All require an oral presentation or performance for the faculty.

Senior majors who qualify the College of Liberal Arts Honors Program and have earned a 3.00 in the major are, with the approval of the faculty, qualified to undertake an honors project. Students wishing to complete an honors project meet with the departmental honors advisor, who advises them on finding an appropriate faculty project advisor; preparing and gaining acceptance for a written proposal; presenting of the work; and evaluating the outcome.

Minor

A minor in theatre arts requires 15 semester hours of course work in theatre arts with a minimum grade-point average of 2.00. Twelve of these semester hours must be taken in advanced course work at The University of Iowa. Any course in the department—excluding 49:2 Theatre and Society, 49:20 Basic Acting, and 49:91 Production—may be used as advanced course work for the minor.

Graduate Program

Master of Fine Arts

The M.F.A. programs are dedicated to the creative development of theater artists. Graduates have a solid background in major performance theories, dramatic literature, and practices of the past and present as well as in the craft of their chosen specialties. Particular attention is given to understanding the role and importance of live theater in society. Interactions among the various disciplines of the theater are explored and the collaborative nature of theater is emphasized both in classes and through the extensive production program.

Students who demonstrate exceptional ability in acting, directing, playwriting, design, technical direction, or production stage management may apply for admission to the program of study and production leading to the M.F.A. Admission is based on interview, audition, and/or a portfolio of relevant artistic work in addition to the undergraduate record, other records or proof of artistic accomplishment, and letters of recommendation. Degree requirements include six semesters in residence, the requisite number of graduate credits in the individual programs, a 3.00 grade-point average, and a record of substantial creative work of high quality. Students must make normal progress toward the completion of the degree requirements to remain in the program. Normal progress is defined as maintenance of a 3.00 grade-point average in all course work attempted and a record of substantial creative work of high quality. Students who fail to make normal progress are placed on academic probation and given one additional semester to demonstrate their qualifications for earning the degree.

Specific information on any of the M.F.A. programs may be obtained from the Department of Theatre Arts.

Facilities

The University of Iowa has one of the finest educational theater complexes in the country. The Theatre Building offers three theaters and up-to-date facilities for classroom, laboratory, shop, and performance work.

The E.C. Mabie Theatre, a continental-style, 477-seat proscenium playhouse, is one of the finest theaters of its type in the United States. Theatre A is a "black box" production space. Flexible seating units that accommodate from 140 to 225 people allow modification of space and audience relationships. Theatre B, which seats 144, is an open stage theater dedicated primarily to the production of new and experimental works from the Iowa Playwrights Workshop. All three theaters are equipped with state-of-the-art electronic lighting control and sound reproduction systems.

In addition to special classrooms for acting and directing, several spaces are designed for teaching particular aspects of dramatic studies. The "movement room" is for study of movement and motion by acting students. The "intelligent classroom" is equipped with videotape, laser disc, closed circuit and cable television, audio systems,

and computer information retrieval systems. The Arnie Gillette Design Studio, named for former professor of design and head of Iowa's theater program, serves as classroom and studio workshop for technical and design students. The Computer-Aided Design Lab provides professional-quality, computer-aided design (CAD) programs for use by designers and technical directors.

To support its production schedule and to provide students with an appropriate range of experience, the department maintains shops for building, painting, maintaining, and storing scenery, costumes, and properties. Using these shops, students learn to work in metal, plastics, canvas, and wood.

Courses

Primarily for Undergraduates

49:000 Cooperative Education Internship 0 s.h.

49:1 Art of the Theatre 3 s.h.
Purpose, principles, disciplines, practitioners and their methods, and conditions of performance. GER: humanities.

49:2 Theatre and Society 3 s.h.
Historical investigation of relationship between theater and society in Europe and America early nineteenth century to the present; examination of modern theatrical movements (e.g., naturalism, surrealism, Epic Theatre), their ideas, and their work as responses to conditions of society and of the theater itself. GER: historical perspectives.

49:3 Creativity and the Theatre 3 s.h.
The creative process in theatre for actors, directors, designers, and writers; interdisciplinary theatre exercises focus on generating ideas, lateral thinking, and expanding artistic perception.

49:9 Workshop in Theatre Arts 0-2 s.h.
A two-week workshop for high school students with special interest in theater; intensive instruction in improvisation, theater games, scene study, and acting style; concludes with a production or scene presentations. Offered summer sessions.

49:13 Shakespeare 3 s.h.
Same as 8:72.

49:20 Basic Acting 3 s.h.
Beginning acting for the nonmajor; exercises in concentration, relaxation, imagination, observation, and sensory awareness; development of theatrical creativity through objectives, obstacles, action, conflict, and moment-to-moment spontaneity; culminates in the development of a scene.

49:21 Acting I 3 s.h.
Beginning acting; creativity and imagination; exercises designed to engage the mind, body, and voice in theatrical play; particular attention paid to improvisation and openness. Open only to theater majors.

49:22 Acting II 3 s.h.
Introduction to scene study and analysis; primary focus on realistic material and development of the collaborative dynamic in two-character and group situations. Prerequisite: 49:21.

49:28 Basic Stage Combat 2 s.h.
Introduction to the principles, safety, and techniques involved in nonviolent hand-to-hand stage combat for the actor, director, and choreographer.

49:29 Basic Acting II 3 s.h.
Continuation of 49:20; emphasis on developing creative expression through exercises, improvisation, mime, theater games, and scenes.

49:30 Expressive Movement for the Performer 3 s.h.
Relaxation, movement, awareness, and improvisation integrated to release tension, expand freedom of movement, and promote creativity.

49:40 Stagecraft Practicum 3 s.h.
Practical experience in the construction, painting, and lighting of scenery and properties. Offered fall semesters.

49:41 Costume Practicum 3 s.h.
Practical experience in construction, dyeing, and texturing of costumes and costume properties. Offered spring semesters.

49:43 Elements of Design 3 s.h.
Elements and principles of design, color, media, and the creative process.

49:60 Play Script Analysis 3 s.h.
Examination of the dynamics of play structure; various readings from historical and contemporary drama.

49:62 Basic Playwriting 3 s.h.
Elements of playwriting, with special emphasis on the one-act play; analysis and discussion of original student writing.

49:91 Production 1 s.h.
Production work in costume, scene, property, and electric shops and on performance crews; theater students participate in at least two areas. May be repeated.

49:93 Voice Improvement 3 s.h.
Practical introduction to voice and speech for public speakers, lecturers, broadcasters, and non-major actors.

49:94 Oral Interpretation of Literature 3 s.h.
Introduction to principles and practice of reading literary prose and poetry to audiences; analysis, interpretation, evaluation.

49:95 Senior Project 1 s.h.
Faculty-evaluated project in the student's interest area.

49:99 Honors Theatre Arts arr.

For Undergraduates and Graduates

49:101 Costume History I 3 s.h.
History of costume and fashion from their origins to the beginning of the English Restoration. Same as 17:185.

49:102 Workshop in the Teaching of Acting arr.
Workshop in the techniques of teaching actors; improvisation, theater games, creativity exercises, analysis and group dynamics. Offered summer sessions.

49:103 Workshop in Dramatic Literature and Play Analysis arr.
Workshop in play reading and analysis. Offered summer sessions.

49:104 Workshop in Costume Design and Execution: An Introduction arr.
Workshop in costume design fundamentals; introduction to costume cutting, painting, sewing, and finishing. Offered summer sessions.

49:105 Workshop in Scenic Design and Execution: An Introduction arr.
Workshop in scenic design fundamentals; introduction to drafting, rendering, and sketching; consideration of technical requirements in design. Offered summer sessions.

49:106 Workshop in Lighting Design and Execution: An Introduction arr.
Workshop in lighting design fundamentals; consideration of lighting design for the high school stage; introduction to lighting controls and instruments. Offered summer sessions.

49:107 Workshop in Stage Directing: An Introduction arr.
Workshop in stage directing; topics such as script analysis, auditioning, working with actors, stage blocking, style. Offered summer sessions.

49:108 Theatre History I 3 s.h.
Survey of drama and theater in its historical and philosophical context in Greece of the fifth-century B.C. through seventeenth-century England, Spain, and France; areas of study include dramatic genres, theater architecture and scene design, acting styles, theater and ritual, and paratheatricals. Offered fall semesters.

49:109 Theatre History II 3 s.h.
Continuation of 49:108, from the English Restoration to present. May be taken out of sequence. Offered spring semesters.

49:111 Costume History II 3 s.h.
History of costume and fashion from the English Restoration to present. Offered spring semesters of even years. Same as 17:186.

49:114 Contemporary Theatre 3 s.h.
Analysis and discussion of recent plays.

49:117 American Drama Since 1945 3 s.h.
Same as 8:197.

49:118 Directing I 3 s.h.
Introduction to basic elements of stage directing; exercises in composition, emphasis, movement, and rhythm; the director's role in the production process; preparation of short scenes. Consent of instructor required. Prerequisites: 49:21, 49:43, and 49:60.

49:119 Directing II 3 s.h.
Continuation of 49:118; advanced exercises in theatricality employing basic elements; focus upon theatrical storytelling and production style; introduction to concept building. Prerequisite: 49:118.

49:120 Mask Improvisation 3 s.h.
Introduction to mask improvisation technique.

49:121 Acting III 3 s.h.
Alternative approaches to acting; methods of acting expression that differ from the standard realist/cognitive approach, including acting on impulse, the internal/external "mask," story theater, working within and against "type," and use of psycho-physical techniques. Prerequisites: 49:22, 49:125, 49:126, and an audition.

49:122 Acting IV 3 s.h.
Advanced scene work; development of major roles, characterizations, research, approaches to style, audition pieces. Prerequisites: 49:121 and an audition.

49:123 Workshop in Voice and Speech Training 2 s.h.
Skills for teachers who work with students in proper use of the voice; practical exercises in voice and speech techniques. Offered summer sessions.

49:125 Voice for the Actor 3 s.h.
Introduction to basic stage voice and speech; techniques developing relaxation, centered breath, efficient warm-up, resonance, articulation, and muscular flexibility; promotes mature, versatile, nonregional voice and speech. Prerequisite: 49:21.

49:126 Movement for the Actor 3 s.h.
Movement awareness through the specific application of techniques to relax stress and tension while freeing energy for ease and flexibility in expressive movement; relation of self to character through movement; topics may include emphasis on improvisational choreography, pantomime, rhythm/tap, period court dances. May be repeated. Prerequisite: 49:21.

49:127 Actor's Technique 2-3 s.h.
Technique class in specific voice and speech skills; topics may include: voice and speech for the actor, phonetics, text analysis, sound exploration, contemporary and classical text interpretation, and dialects; solo performance project. May be repeated. Consent of instructor required.

49:128 Advanced Acting 3 s.h.
Preprofessional training in acting; topics may include psycho-physical training in impulse, openness and the "mask," individual and group dynamics, characterization and scenework, Shakespeare and "style," on-camera, the development of professional work habits and skills, the audition/interview situation. May be repeated. Consent of instructor required.

49:129 Stage Combat 3 s.h.
Principles, safety, and techniques of nonviolent, hand-to-hand stage combat for the actor, director, and choreographer. Consent of instructor required.

49:130 Workshop in Scenery and Prop Construction 2 s.h.
Construction of stage scenery and props, including flats, platforms, steps, the use of plastics and foam, and legging and rigging techniques; ways to cut construction time and expense and to solve construction problems. Offered summer sessions.

49:132 History of Scenography 3 s.h.
Historical view of the evolution of the physical theatre and scenic elements of theater.

49:133 Stage Management 3 s.h.
Duties and procedures for stage managers; work on a production as stage manager or assistant. Offered fall semesters. Prerequisites: 49:40 and 49:41.

49:134 Scene Design I 3 s.h.
Concepts and procedures for design of theatrical scenery. Prerequisites: 49:40 and 49:43. Same as 1P:134.

49:135 Costume Design I 3 s.h.
Introduction to procedures and tools of costume design; research, rendering, swatching, critique. Prerequisites: 49:41 and 49:43.

49:136 Lighting Design I 3 s.h.
Importance of light to visual perception; optical control of light; introduction to design responsibilities and procedure. Prerequisites: 49:40 and 49:43.

49:137 Textile Design: Forms and Fibers 1-4 s.h.

49:138 Environmental Design I 3 s.h.
Same as 1D:137.

49:139 Life Drawing II 3 s.h.
Same as 1F:105.

49:140 Historic Styles I 3 s.h.
Study of architecture, clothing, and fine, domestic, and industrial arts of selected periods to develop methods of research and analysis for stage design. Offered fall semesters of even years.

49:141 Historic Styles II 3 s.h.
Continuation of 49:140. Offered spring semesters of odd years.

49:142 Drawing for Theatrical Design 3 s.h.
Practice in representing architectural and organic forms; for designers of scenery, costumes, and lighting. Offered fall semesters of even years. Pre- or corequisite: 49:43.

49:143 Rendering 3 s.h.
Exploration of presentation techniques for scene, costume, and lighting designs. Offered spring semesters of odd years. Pre- or corequisite: 49:43.

49:144 Scene Painting 3 s.h.
Lectures on scene painting materials, shop layout, and techniques of applying scene paint; exercises painting on floor and paint frame. Offered spring semesters of even years. Pre- or corequisites: 49:40 and 49:43.

49:145 Stage Makeup 1-2 s.h.
Application and design of stage makeup.

49:146 Drafting I 3 s.h.
Tools and conventions of theatrical drafting for design and technical drawing. Offered fall semesters.

49:147 Technical Production I 3 s.h.
Production organization and traditional construction and rigging techniques. Offered fall semesters of even years. Prerequisite: 49:40.

49:148 Technical Production II 3 s.h.
Nonmathematical introduction to static mechanics, including strength of materials and design of wood and steel structures. Offered spring semesters of odd years. Prerequisite: 49:147.

49:149 Advanced Scenery Construction 3 s.h.
Mechanics of motion related to scenery, stage machines, and special rigging problems. Offered fall semesters of odd years. Prerequisite: 49:148.

49:150 Shop Practice 3 s.h.
Craft techniques for wood, metals, and plastics. Offered fall semesters of odd years. Prerequisite: 49:40.

49:151 Properties and Special Effects 3 s.h.
Construction and finishing of theatrical properties; development and control of special effects. Offered spring semesters of even years. Prerequisite: 49:40.

49:152 Costume Crafts: Drafting and Draping 3 s.h.
Modern and historic pattern design and drafting; analysis and solution of fitting problems; development of patterns from theatrical designs. Offered fall semesters of even years. Prerequisite: 49:41.

49:153 Textile Design: Printing and Dyeing 1-3 s.h.
May be repeated. Prerequisite: two basic studio courses. Same as 17:160, 1P:191.

49:154 Costume Crafts: Advanced Drafting and Draping 3 s.h.
Advanced projects in pattern development for theatrical designs; corset construction and development of other body-shaping garments and padding for the theater. Offered spring semesters of odd years.

49:155 Costume Crafts: Accessories 3 s.h.
Construction of personal and costume properties, millinery, armor, footwear, and related items. Offered spring semesters of even years. Prerequisite: 49:41.

49:157 Advanced Scene Design 3 s.h.
Historical research and development of production concepts for projects in scenery and property design; model construction. Prerequisites: 49:60, 49:134, and 49:140-141.

49:158 Advanced Costume Design 3 s.h.
Advanced projects in costume design; development of production concepts; patterning, fabrics, budgeting. Prerequisites: 49:60, 49:101, and 49:135.

49:159 Lighting Design II 3 s.h.
Development of production concepts; electrical control systems; design projects. Prerequisites: 49:60 and 49:136.

49:160 Lighting Design III 3 s.h.
The art of lighting; advanced design projects; specialized technical solutions. Prerequisites: 49:60 or 49:260, 49:159, and a studio drawing course.

49:161 Sound Design for the Theatre 3 s.h.
Conception and development of sound scores for performance of dramatic works; sound studio equipment and technique. Prerequisites: 49:40 and 49:60.

49:162 The Serial 4 s.h.
Development and production of ten episodes of a serial for the stage. Consent of instructor required.

49:163 Adaptation 3 s.h.
Dynamics of playwriting explored through transforming fictional and documentary materials into playscripts. Consent of instructor required.

49:164 Playwriting for Other Media 3 s.h.
Playwriting for radio and television: the demands of other media.

49:165 Playwrights, Directors, and Designers 3 s.h.
A class in artistic collaboration. Open to playwrights, directors, and designers for the Iowa Playwrights' Festival. Consent of instructor required.

49:166 Dramaturgy 3 s.h.
Theory and practice of dramaturgy: history in Europe and America; relationship to dramatic theory and criticism; practical experience in season planning, play analysis, revision, adaptation, evaluation, "development" of new plays, and consultation with directors. Consent of instructor required.

49:167 Advanced Playwriting 3 s.h.
Continuation of 49:62; analysis and discussion of original student writing; extensive rewriting and play finishing; discussion of play scripts of contemporary writers. Consent of instructor required.

49:169 Playwriting: The Docudrama 3 s.h.
Documentary writing for the stage; analysis of stage, television, and film documentaries; students write a stage play using factual material. Consent of instructor required.

49:172 Director's Seminar 3 s.h.
Preprofessional training in stage direction; the art and craft of directing; research and practical experience; development of new pieces; approaches to a variety of theatrical materials through concept, type, and style; collaboration with designers; topics vary. May be repeated. Consent of instructor required.

49:180 Black Action Theatre 3 s.h.
Same as 129:176.

49:181 Medieval Drama 3 s.h.
Same as 8:144.

49:182 Shakespeare 2-3 s.h.
Same as 8:122.

49:183 Restoration Drama 3 s.h.
Same as 8:146.

49:185 Modern Drama: Ibsen to Shaw 3 s.h.
Same as 8:148.

49:186 Modern Drama: Brecht to Stoppard 3 s.h.
Same as 8:149.

49:187 English Renaissance Drama 3 s.h.
Same as 8:145.

49:188 American Drama to 1945 3 s.h.
Same as 8:150.

49:189 Studies in Drama 3 s.h.
Same as 8:167.

49:191 Greek Drama in Translation 3 s.h.
GER: humanities. Same as 14:108.

49:195 Afro-American Drama 3 s.h.
Same as 129:180, 8:154.

49:196 Projects in Theatre arr.
Guided study or individual project. Consent of instructor required.

49:197 Repertory Theatre arr.
The experience of modern repertory theater. May be repeated up to of 6 s.h. Offered summer sessions.

49:198 Shakespeare: Selected Plays 3 s.h.
Same as 8:165.

49:199 Independent Study arr.

49:213 Shakespeare: Later Plays 3 s.h.
Same as 8:253.

49:215 Ideas in Theatre I 3 s.h.
Thematic approach to history of theater and drama; four sections—myth, formal religion, secular power models, and democratic or popular forms; chronology from pre-Greek drama through the eighteenth century, with examples from contemporary drama to trace influences; shaping of physical space for theatrical events; for students with background in theater history. May be taken out of sequence.

49:216 Ideas in Theatre II 3 s.h.
Thematic approach to history of theater and drama; four sections—naturalism; synthesis; art movements including expressionism, symbolism, and constructivism; and social movements including *agit-prop;* chronology from 1850 to the present; for students with background in theater history. May be taken out of sequence.

49:217 Performance Theory 1-4 s.h.
Aesthetic theories of theatrical innovators or groups; systems of aesthetic thought; readings and exercises; content varies. May be repeated.

49:240 Studio in Theatrical Design 3 s.h.
Advanced projects for theatrical design in drama, opera, and dance. Consent of instructor required. Same as 1P:204.

49:241 Drafting II 3 s.h.
Industrial drafting methods as applied to theater; problem solving through graphic methods; computer-aided drafting. Offered spring semesters of even years. Prerequisite: 49:146.

49:242 Production Management 3 s.h.
Organization and supervision of theatrical production. Offered spring semesters of even years. Consent of instructor required.

49:243 Shop Design 3 s.h.
Equipment, facilities, and layout of scene, costume, property, and electric shops for theaters. Offered fall semesters of even years. Consent of instructor required.

49:260 Advanced Playscript Analysis 3 s.h.
Analysis of play scripts for theater artists; extensive reading of historic and contemporary plays. May be repeated by M.F.A. candidates.

49:269 Playwrights Workshop 3 s.h.
Presentation and discussion of work by members of the Iowa Playwrights' Workshop. Consent of instructor required.

49:297 M.F.A. Production 1-4 s.h.
Appropriate assignments in all aspects of play production. Consent of instructor required.

49:417 History of Criticism Plato to 1700 3 s.h.
Same as 8:261, 48:261, 14:261.

49:418 History of Criticism 1700-1950 3 s.h.
Same as 8:262, 48:262.

49:622 Seminar: Theatre History arr.

TRANSPORTATION STUDIES

Transportation is perhaps the most vital need of a modern society. In the United States, as in most other nations, there exist numerous critical transportation problems and issues. The highway system is reaching an advanced stage of its life cycle, public

transit operating deficits are growing, the quality of transportation available to many citizens is unacceptably low, serious financing inequities exist, and extensive changes are needed in traditional transportation institutions.

Transportation planners and analysts must draw on a number of disparate skills to respond to the challenges they face. They are required to analyze and forecast the movement of people and goods within and between cities; identify the most efficient means for providing needed transportation services; price these services properly; and evaluate the effects of changes in transportation services or policies on land use, environmental quality, the local or regional economy, and various subgroups within society.

Graduate Programs

Certificate

No single discipline can supply all of the theories, principles, or methods needed to address the varied and complex problems in transportation. Recognizing this, three academic units at The University of Iowa participate in an interdisciplinary transportation program. The Department of Civil and Environmental Engineering, the Department of Geography, and the Graduate Program in Urban and Regional Planning have established a graduate certificate program, which enables students in these academic units to obtain an additional credential along with their graduate degrees.

The Transportation Certificate program is coordinated by the Center for Transportation Studies and operated in conjunction with the Midwest Transportation Center, a consortium of The University of Iowa and Iowa State University. Completion of the requirements for a certificate is documented on the student's transcript. The certificate is awarded in conjunction with the established degree requirements of the individual academic units.

Students who wish to enroll in a course of study leading to transcript certification may apply for selection as Midwest Transportation Center Graduate Scholars. They are required to complete an integrated systems course offered jointly by the two consortium universities, and they must participate in a research seminar that requires commitment to a project involving a public agency or a private sector firm operating in the region.

Degree Programs in Civil and Environmental Engineering

The Department of Civil and Environmental Engineering offers degrees in transportation at both the Master of Science and Doctor of Philosophy levels. The M.S. degree may be earned either without thesis, requiring a minimum of 30 semester hours of credit, or with thesis, a 30-semester-hour program that includes up to 6 semester hours of credit for thesis research. Nonthesis students usually are required to complete a research paper based on independent study and must defend the paper in an oral examination.

The Ph.D. degree involves a minimum of 72 semester hours beyond the B.S. degree, with up to 18 semester hours earned for dissertation research. A minimum of one year of campus residency is required.

Individuals with degrees in transportation-related disciplines as well as in civil engineering are encouraged to apply. Depending on the student's background, it may be necessary to complete courses in statistics, computer programming, simulation, mathematics, and operations research without being able to apply the course credit to semester hours needed for the degree program.

A typical master's level program includes the following courses:

First Semester

53:262 Urban Transportation Planning	3 s.h.
102:260 Transportation Policy and Planning	3 s.h.
102:269 Transportation Program Seminar	1 s.h.
44:134 Methods of Transportation Analysis	3 s.h.
Technical elective	3 s.h.

Second Semester

53:163 Transportation Systems Analysis	3 s.h.
102:261 Problems in Transportation and Land Use	3 s.h.
102:269 Transportation Program Seminar	1 s.h.
44:236 Travel Demand Modeling	3 s.h.

One of the following courses:

53:199 Research: Civil and Environmental Engineering M.S. Thesis	3 s.h.
Statistics	3 s.h.
Planning elective	3 s.h.
Integrated transportation course	3 s.h.

Third Semester

53:198 Individual Investigations: Civil and Environmental Engineering	3 s.h.
53:199 Research: Civil and Environmental Engineering M.S. Thesis	3 s.h.
Technical elective	3 s.h.
102:269 Transportation Program Seminar	1 s.h.

Technical electives are advanced courses in engineering operations research, computer-aided design, or economics. Specific course requirements are sufficiently flexible to conform to a student's graduation schedule and desired area of specialization. Applications should be made through the Graduate College and the Department of Civil and Environmental Engineering.

Degree Programs in Geography

The Department of Geography offers Master of Arts and Doctor of Philosophy degrees with a specialization in transportation systems analysis. The transportation specialty draws on the resources of the College of Engineering, the Graduate Program in Urban and Regional Planning, the Department of Economics, and Geography. The specialty has a strong quantitative orientation and is designed to provide students with a broad range of skills relevant to transportation and urban and regional analysis. It also helps students develop an appreciation of political and organizational considerations affecting transportation systems and of the exigencies of practical problem solving.

M.A. students typically take five courses in transportation and urban and regional analysis, three quantitative methods courses, and four additional courses in geography or economics. The M.A. degree is available with or without a thesis. If a thesis is prepared, it can substitute for two of the courses. Students who have studied calculus as undergraduates can complete the master's program in four semesters. Students who have not studied calculus as undergraduates or who have research or teaching assistantships may require an additional one or two semesters to complete the program.

A typical master's level program includes the following courses.

First Semester

22S:120 Probability and Statistics	4 s.h.
102:260 Transportation Policy and Planning	3 s.h.
102:269 Transportion Program Seminar	1 s.h.
44:134 Methods of Transportation Analysis	3 s.h.

Second Semester

6E:184 Introduction to Econometrics	3 s.h.
102:261 Problems in Transportation and Land Use	3 s.h.
44:350 Research Seminar: Staff	1 s.h.
44:137 Economic Theory of Location	3 s.h.

Third Semester

6E:203 Microeconomics I	3 s.h.
53:262 Urban Transportation Planning	3 s.h.
44:175 Locational Conflict	3 s.h.
44:350 Research Seminar: Staff	1 s.h.

Fourth Semester

44:236 Travel Demand Modeling	3 s.h.
44:350 Research Seminar: Staff	1 s.h.
44:285 Methods of Regional Analysis: Regional Science	3 s.h.

or

44:293 Advanced Location Theory 3 s.h.

Integrated transportation course 3 s.h.

Ph.D. students, in addition to taking the courses recommended for master's students, are strongly encouraged to take advanced courses in areas such as economics, operations research, regional development, and location theory and analysis. Ph.D. students also are required to undertake original research leading to the preparation of a dissertation. Applications should be made through the Graduate College and the Department of Geography.

Degree Programs in Urban and Regional Planning

The Graduate Program in Urban and Regional Planning offers Master of Arts and Master of Science degrees with a sectoral major in transportation. During the first year, students complete an integrated core curriculum, consisting of courses in planning economics and public finance, analytic methods, planning theory, collective decision making, law, and information presentation. The second year is devoted to a sectoral major, such as transportation, wherein core concepts are applied to a chosen area of specialization. The planning curriculum is intended to provide students with the capability to examine policy issues in transportation, devise workable options, evaluate these optional courses of action, and work toward implementation of policy solutions.

Planning students complete a total of 48 semester hours and an internship. Twenty-seven semester hours are accounted for by the core; the sectoral major constitutes a minimum of 9 semester hours; and electives are taken to complete the remaining hours. If the thesis option is selected, up to 6 semester hours of sectoral major credit are awarded. Students may elect to complete an additional 2 semester hours of course work in lieu of an internship, bringing the total to 50 semester hours.

A typical transportation sectoral major program includes the following courses:

First and Second Semesters

Core courses (See "Urban and Regional Planning" in this section of the *Catalog*.)

Third Semester

Planning Elective 3 s.h.
102:260 Transportation Policy and Planning 3 s.h.
102:269 Transportation Program Seminar 1 s.h.

Two of the following courses:

44:134 Methods of Transportation Analysis 3 s.h.
102:262 Urban Transportation Planning 3 s.h.
Planning elective 3 s.h.

Fourth Semester

102:261 Problems in Transportation and Land Use 3 s.h.

Three of the following courses:

102:263 Transportation Systems Analysis 3 s.h.
102:265 Transportation Regulation and Finance 3 s.h.
44:236 Travel Demand Modeling 3 s.h.
Integrated transportation course 3 s.h.

Students select the optional transportation course according to individual interest. Elective courses typically include:

102:234 Project Impact Analysis 3 s.h.
102:236 Capital Facilities Planning and Finance 3 s.h.
102:245 Energy and Public Utility Policy and Planning 3 s.h.
102:295 Economic Development Policy 3 s.h.
102:298 Development Finance 3 s.h.

Applications should be made through the Graduate College and the Graduate Program in Urban and Regional Planning.

UNIFIED PROGRAM

Coordinator: Phillip C. Kutzko
Faculty: Stavros Deligiorgis (English), Miriam Gilbert (English), Mae Henderson (African-American World Studies), Sydney V. James (History), Philip C. Kutzko (Mathematics), Eugene W. Madison (Mathematics), Doug Madsen (Political Science), Donald G. Marshall (English), Don McCloskey (History), Dennis M. Moore (Rhetoric), Donald Pietrzyk (Chemistry), William Reisinger (Political Science), Maureen Robertson (Asian Studies), Rebecca Rodgers (History), Richard Sjolund (Botany)

Unified Program (UP) is a four-semester series of integrated general education courses for a small group of students who begin the program as entering freshman. UP satisfies all of the College of Liberal Arts General Education Requirements except the foreign language and physical education requirements, and each UP course is interchangeable with an equivalent approved course. Students in version A must be eligible for 10:3 Rhetoric; students in version B must be eligible for 10:3 Rhetoric and for calculus. All students in UP take the courses offered for the A or B version in a given semester. Students may leave the program at any time and satisfy the General Education Requirements in other ways, but only first-semester freshmen may enter UP.

Version A

Freshman Year

Fall semester:
140:43 Humanities I 3 s.h.
140:47 Politics I 3 s.h.
140:55 Rhetoric 4 s.h.

Spring semester:
140:44 Humanities II 4 s.h.
140:48 Politics II 3 s.h.
140:56 Basic Mathematics 4 s.h.

Sophomore Year

Fall semester:
140:45 Humanities III 4 s.h.
140:49 History I 3 s.h.
140:57 General Chemistry I 3 s.h.

Spring semester:
140:40 Human Biology 4 s.h.
140:50 History II 3 s.h.

Version B

Freshman Year

Fall semester:
140:70 UP Science Seminar 1 s.h.
140:85 Rhetoric I 4 s.h.
140:86 Calculus 4 s.h.
*Natural sciences elective 3-4 s.h.

Spring semester:
140:70 UP Science Seminar 1 s.h.
140:71 Interpretation of Literature 3 s.h.
*Natural sciences elective 3-4 s.h.

Sophomore Year

Fall semester:
140:70 UP Science Seminar 1 s.h.
140:77 Historical Perspectives I 3 s.h.
140:83 Intro to Afro-American Culture 3 s.h.

Spring semester:
140:68 Asian Humanities 3 s.h.
140:70 UP Science Seminar 1 s.h.
140:78 Historical Perspectives II 3 s.h.

*Version B students select their natural sciences course in consultation with their major adviser.

Courses

Course 140:44 Humanities II satisfies 8G:1 The Interpretation of Literature, which is required for the General Education Requirement in the humanities.

140:40 Human Biology **4 s.h.**

140:43 Humanities I **3-4 s.h.**
Development of major ideas about the human beings and the divine in Western religion, philosophy, and literature. GER: humanities.

140:44 Humanities II **3-4 s.h.**
Major medieval and Renaissance writers, including Dante, Chaucer, and Shakespeare. Satisfies 8G:1.

140:45 Humanities III **4 s.h.**
The development of modernism, as seen through art, architecture, music, philosophy, psychology, and literature in Vienna between 1890-1940. GER: humanities, foreign civilization and culture.

140:47 Politics I **3-4 s.h.**
Focus on patterns and the basis of political behavior; emphasis on common elements across social, organizational, and institutional settings. GER: social sciences.

140:48 Politics II **3-4 s.h.**
Government and politics in contrasting political systems from industrial and agrarian societies. GER: social sciences.

140:49 History I **3-4 s.h.**
A topical course built around the issue of encounter and incorporation as European civilizations confront the non-European world. GER: historical perspectives, foreign civilization and culture.

140:50 History II **3-4 s.h.**
Continuation of History I, with examples drawn primarily from modern history. GER: historical perspectives, foreign civilization and culture.

140:51 Science I 3-4 s.h.
GER: natural sciences.

140:52 Science II 3 s.h.
GER: natural sciences.

140:54 Anthropology 3 s.h.
GER: social sciences.

140:55 Rhetoric 4 s.h.
Accelerated writing, reading, and speaking.

140:56 Basic Mathematics 4 s.h.
Precalculus course; emphasis on theoretical understanding of functions. GER: quantitative or formal reasoning.

140:57 General Chemistry I 3 s.h.
Special UP section of Chemistry 4:7; for students with no high school chemistry. GER: natural sciences.

140:68 Asian Humanities 3 s.h.
Selected literature from traditional and modern China. GER: foreign civilization and culture, humanities.

140:70 UP Science Seminar 1 s.h.
Focus on common elements in the UP natural sciences courses.

140:71 Interpretation of Literature 3-4 s.h.
Exploration of poetry, short fiction, drama, and the novel, mainly English and American.

140:72 Music I 3-4 s.h.
GER: humanities.

140:73 Music II 3-4 s.h.
GER: humanities.

140:75 Anthropology 3-4 s.h.
GER: social sciences.

140:76 Psychology I 3-4 s.h.
GER: social sciences.

140:77 Historical Perspectives I 3 s.h.
Study of Western civilization to 1792. GER: historical perspectives, foreign civilization and culture.

140:78 Historical Perspectives II 3 s.h.
Study of Western civilization since 1792. GER: historical perspectives, foreign civilization and culture.

140:80 Principles of Chemistry I 3 s.h.
GER: natural sciences.

140:81 Principles of Chemistry II 3 s.h.
GER: natural sciences.

140:82 Principles of Chemistry Lab 2 s.h.

140:83 Intro to Afro-American Culture 3 s.h.
The Black experience in the United States. GER: humanities.

140:85 Rhetoric I 4 s.h.
Accelerated writing, reading, and speaking.

140:86 Calculus 4 s.h.
Fundamental concepts, methods, and techniques of single variable differential and integral calculus. Equivalent to 22M:25. GER: quantitative or formal reasoning.

URBAN AND REGIONAL PLANNING

Chair: Peter S. Fisher
Professors: David J. Forkenbrock, John W. Fuller
Professor emeritus: James L. Harris
Associate professors: Peter S. Fisher, James W. Stoner
Assistant professors: Cheryl K. Contant, Abdi Samatar, James A. Throgmorton
Adjunct lecturers: Karin A. Franklin, Andrew J. McKean
Graduate degrees offered: M.A., M.S. in Urban and Regional Planning

Planning encompasses the development of public policy alternatives to improve the quality of life in cities and regions. Planning is a dynamic and changing field. Today planners find themselves in demand for such diverse jobs as community energy management specialist, regional transit planner, environmental analyst with a state pollution control agency, public facilities planner with an engineering firm, economic development planner for rural communities, state public health planner, planner with a nonprofit neighborhood housing organization, state legislative analyst, and human services planner.

The University of Iowa planning program is a two-year master's program fully accredited by the Planning Accreditation Board. The program is built on the premise that planners must be educated in methods of policy analysis and that there is a common body of knowledge, represented in the core curriculum, that provides a solid foundation for all specializations in the field.

As an independent academic unit administratively aligned with the Graduate College, the program has benefited from an opportunity to develop its curriculum and faculty interests without the constraints imposed by affiliation with another discipline or professional field.

Faculty and students in the University's planning program bring to each other a wide range of experience and prior education. Academic backgrounds of the faculty include planning, public policy, economics, operations research, geography, engineering, political science, and law. The program's students have diverse undergraduate majors, including economics, political science, geography, architecture and landscape architecture, environmental sciences, engineering, anthropology, sociology, urban studies and planning, English, biology, history, classics, and philosophy. Usually, about one-third of the program's 40 to 50 graduate students are women. Largely because of the common core of courses, students get to know each other quickly; a significant portion of the educational experience takes place in informal discussion.

Recent graduates of Iowa's planning program have assumed positions with city, metropolitan, and regional planning agencies, in state and federal government, and in the private sector. The past several years' graduates took positions in all geographic regions of the United States and in several foreign countries.

Graduate Programs

The planning curriculum is a 48-semester-hour (plus internship) program encompassing two academic years. It includes 27 semester hours of core courses, 9 semester hours of sectoral major courses, and 12 semester hours of free electives. The curriculum is based on the philosophy that planners must develop the theoretical and analytical skills that permit them to analyze social problems and evaluate public policies, as well as the professional skills (e.g., report writing, presentations, team management) that allow them to function effectively in various organizational and political environments.

Core Curriculum

At the heart of The University of Iowa planning program is a unique and integrated core curriculum, which occupies the first academic year. The function of the core is to develop an understanding of the institutions—the social, economic, political, administrative, and legal systems—that provide the context for policy analysis and constrain public choices; a capability for identifying social goals and normative criteria for evaluating public policies; and analytic skills—both quantitative (e.g., statistics, forecasting, surveys, regional analysis) and nonquantitative. In total, the core accounts for 27 semester hours.

Courses in the first semester are derived primarily from traditional disciplines—particularly economics and statistics, together with an introduction to the theories and practice of planning. As students proceed through the core, increasing reliance is placed on the development of critical judgment and insight in the application of theory through realistic planning problems and actual case studies. Students may request a waiver of a core course on the basis of previous course work.

Courses in the core curriculum are as follows:

First Semester

102:203 History and Theories of Planning	3 s.h.
102:205 Economics for Policy Analysis I	3 s.h.
102:210 Introduction to Analytic Methods	3 s.h.
102:212 Information Presentation	3 s.h.

Second Semester

102:204 Collective Decision Making	3 s.h.
102:206 Economics for Policy Analysis II	3 s.h.
102:211 Intermediate Analytic Methods	3 s.h.

Third Semester

102:209 Planning Law and Legislation	3 s.h.

Fourth Semester

102:215 Field Problems in Planning	3 s.h.

The Sectoral Major

The second year of the program is directed toward developing an area of concentration, termed a sectoral major, by building on the concepts and skills developed in the core by applying them to a specific problem area. Students fulfill the sectoral major requirement by completing 9 semester hours of credit in courses offered in the planning program and by other departments and schools of the University.

Currently, there are five sectoral majors supported by course offerings and faculty

within the planning program—transportation, housing and community development, environmental planning, infrastructure planning, and economic development. Students may design other sectoral majors, subject to faculty approval. For example, a student can major in health services planning with appropriate course work in the Departments of Hospital and Health Administration or Preventive Medicine and Environmental Health, or in human services planning with courses in the School of Social Work. Other sectoral majors that students have developed include land use, public utility and energy planning, and urban management.

Other Requirements

The master's final examination requirement is satisfied through submission and approval of a portfolio. The portfolio consists of a set of papers and project reports that demonstrates an understanding of fundamental concepts presented in the core; the application of core concepts to the student's sectoral major; and substantive knowledge of issues, institutions, and policies in the sectoral area. The portfolio generally is made up of polished revisions of research papers and project reports for courses. The portfolio must be approved by a final exam committee consisting of three faculty members.

Thesis

A thesis is not required, although students may petition to write one. Students may register for up to 6 semester hours of thesis credit. In addition, they may take up to 8 semester hours of readings to develop a thesis topic and prepare a literature review. Students may apply 3 semester hours of readings to the sectoral major requirement and substitute the thesis for the portfolio.

Internship Practicum

Students are encouraged to complete an internship in a planning or related agency or organization, and to submit a brief paper summarizing and evaluating the experience. Internships usually are completed during the summer. Alternatively, students may elect to complete an additional 2 semester hours of credit, bringing the total required to 50 semester hours.

An extended internship, consisting of at least five months of full-time employment in a planning-related organization, may qualify as a practicum. A practicum generally takes place during the summer and into the fall semester of the second year. The practicum carries 3 semester hours of course credit and substitutes for the required field problems course, 102:215, as well as permitting the 2-semester-hour reduction in degree requirements for the internship.

Joint Programs

Law

The Urban and Regional Planning Program and the College of Law cooperate in administering a program that satisfies the degree requirements leading to an M.A. in planning and a J.D. in law. The program usually requires four years to complete, a reduction of one academic year from the total requirements of the two programs taken separately. It may be completed in less time if the student chooses the accelerated law program. Separate admission to each academic unit is required.

Law is the most popular of the joint degree programs. Students in the planning and law program typically seek employment in law firms—especially those that specialize in land use or environmental law, as city managers, as city attorneys, or as city planners or planning administrators.

Engineering

A program combining a bachelor's degree in engineering with a master's degree in urban and regional planning has been developed for students who want to pursue a career in planning in either the public or private sector. Planning encompasses the development of alternatives to improve the quality of life in cities and regions.

Planners devise courses of action in response to a variety of problems and opportunities and assess the likely outcome of these actions. They are involved in diverse fields such as public transit, low income housing, neighborhood preservation, environmental protection, infrastructure finance, downtown revitalization, social services, and economic development.

Students in the program may acquire a B.S. in engineering and an M.A. or M.S. in planning in a total of five or more academic years. Students should apply for the joint program either when they apply for admission to the engineering college or before they complete their sophomore year following matriculation. A letter requesting admission to this program should be submitted by the student to the College of Engineering, The University of Iowa.

Students in this combined degree program should be aware of the admission requirements for the graduate planning program and should be prepared to meet these requirements when they apply for admission to the program (near the time when they are completing the B.S.E. degree requirements).

The curriculum is based on the philosophy that planners must develop the theoretical and analytical skills that permit them to identify issues and recommend alternate ways of resolving these issues. In addition, planners must develop the professional skills (e.g., report writing, presentations and briefings, computer literacy, team management) that allow them to function effectively in various organizational and political environments. Students become well versed in topics such as economic theory, quantitative methods, information presentation techniques, and approaches to citizen involvement.

At the heart of The University of Iowa planning program is an integrated core curriculum. Its purpose is to provide a rigorous foundation for the analysis of public and social issues. The core program is completed by engineering students in the last two years of the undergraduate program. Sectoral majors (areas of concentration) are organized around public policy problem areas. They include transportation, housing and community development, environmental quality, urban infrastructure, and economic development. Students fulfill the sectoral major requirement by completing 9 semester hours of credit in courses offered by various departments and schools of the University, including the graduate planning program and the engineering college. They complete these courses after graduating from the College of Engineering and while enrolled in the graduate program in urban and regional planning.

Each student is assigned an adviser from engineering and one from planning. During the first four years of the program, students work primarily with their engineering adviser and the assistant to the dean of the College of Engineering. For the fifth year, students confer with their graduate planning adviser.

Preventive Medicine and Environmental Health

A joint master's degree option exists with urban and regional planning and the Department of Preventive Medicine and Environmental Health in the College of Medicine. This option results in an M.A. in planning and an M.S. in preventive medicine and environmental health. Graduates of the program typically find employment in the public health field, with state health and human services departments, or as health or environmental planners.

A total of 60 to 62 semester hours of credit is required; the two degrees generally can be earned in two and one-half years. Separate admission to each academic unit is required.

Hospital and Health Administration

Students interested in health planning may wish to enroll in a joint program between urban and regional planning and the Department of Hospital and Health Administration in the College of Medicine. This three-year program leads to an M.A. in planning and an M.A. in hospital and health administration. Course work is reduced by one year from the separate requirements of the two programs. Separate admission to each academic unit is required.

The hospital and health administration degree enables students to strengthen their credentials as health planners or expand their job options to include administrative positions in the health field as well as health planning jobs. Graduates of the joint degree program typically find employment in hospitals, state departments of health, and other private, nonprofit, or public health agencies.

Economics

Students specializing in economic development, public utility planning, state fiscal analysis and planning, or other areas may wish to strengthen their skills in economic analysis by enrolling in the joint program with the Department of Economics. The combination of economics and applied policy analysis should be valuable for students who want to obtain jobs such as state economic development planner, analyst with a public utility regulatory commission, or fiscal analyst for a state legislature or revenue department.

The program requires a total of 60 to 63 semester hours of credit and usually can be completed in five semesters. Students earn an M.A. in planning and an M.A. in economics.

Social Work

For those interested in a career in social service delivery or human services planning, a joint program is offered in urban and regional planning and the School of Social Work, leading to an M.A. in planning and an M.S.W. in social work. Planning positions are available with city planning agencies, nonprofit social service agencies, and state human services departments.

A total of 86 semester hours is required for the two degrees. This is a reduction of 22 semester hours from the requirements of the two programs taken separately. It is possible to complete the program in three years, although some students may require an additional semester. Separate admission to each academic unit is required.

Transportation

A transportation research and training program is offered through the Center for Transportation Studies, administered through the Urban and Regional Planning Program. A transportation certificate is awarded to students who satisfactorily complete a prescribed set of courses in transportation. These courses are taught in urban and regional planning, engineering, geography, and economics. The certificate program allows planning students with sectoral majors in transportation to extend their training and obtain an additional credential. For more information, see "Transportation Studies" in this section of the *Catalog*.

Financial Aid

Students in the Urban and Regional Planning Program receive several kinds of financial support: tuition scholarships, program teaching or research assistantships, contract or grant-funded research assistantships, and internships in local agencies. All but tuition scholarships typically require ten hours of work per week under the direction of a faculty member or professional planning staff. Students initiate applications for financial support, and awards are made on the basis of merit, experience, and interests. The planning program has been successful in providing support to a majority of its students.

Admission

Admission to the Urban and Regional Planning Program is open to students from any undergraduate major or area of concentration.

Admission is based on Graduate Record Examination (GRE) General Test scores (verbal, quantitative, and analytical), letters of recommendation, and students' previous academic records.

Applicants should submit the application form, GRE General Test scores, letters, and transcripts early in the spring for fall admission (although applications are still accepted until July 15), or by December 15 for spring admission. Fall admission is preferred.

Courses

102:000 Cooperative Education Internship **0 s.h.**

102:101 Introduction to Planning and Policy Development **3 s.h.**
Development of cities in the United States and the emergence of planning as a means of resolving social problems that arise from urbanization; introduction to techniques of planning and the development of public policies in substantive areas such as housing, transportation, community development, and environmental quality.

102:133 Introduction to Transportation **3 s.h.**
Overview of transportation markets—intercity, rural, and urban; transportation modes—rail, highway, air, water, and pipeline; issues in transport regulation, finance, policy, planning, management, and physical distribution. Same as 44:133, 6E:145.

102:134 Methods of Transportation Analysis **3 s.h.**
Interaction between urban form and transportation; public policies toward transportation, transportation technologies for cities, energy consumption, planning and management of transit systems and road networks, and freight transport related to economic development. Same as 44:134.

102:143 Urban Transportation **3 s.h.**
Public policies, institutions, planning, management; production, pricing, distribution of transit and urban highway services; energy consumption, city case studies, urban freight issues. Prerequisites: 6E:1 and 6E:2, or 44:133.

102:146 Women and the City **1-3 s.h.**
Implications of changing family structure and gender roles for the urban environment and for planning and urban policy; where women live and why, restructuring housing and neighborhoods for women; economic development and employment; the feminization of poverty; child care policy; transportation and accessibility for women; women in the global economy. Same as 131:146.

102:162 Planning and Geography of Underdevelopment **3 s.h.**
Same as 44:162.

102:203 History and Theories of Planning **3 s.h.**
History of U.S. urban growth and change as a reflection of social and economic forces; alternative planning philosophies and role choices open to planners.

102:204 Collective Decision Making **3 s.h.**
Theories of decision making as they relate to planning and policy analysis; introduction to dispute resolution, public involvement, implementation, strategic planning, and evaluation; case studies and gaming used to simulate planning experience.

102:205 Economics for Policy Analysis I **3 s.h.**
Fundamental principles of planning economics; concepts and techniques of microeconomic analysis; the role of government in the economy; approaches to analyzing public investments.

102:206 Economics for Policy Analysis II **3 s.h.**
Analysis of the structure and growth of urban areas and public policies for the alleviation of urban problems; economic aspects of land use, service pricing and taxation, and metropolitan fiscal problems.

102:209 Planning Law and Legislation **1-3 s.h.**
Foundations of American constitutionalism, legal method, local government law, and the legislative process from the perspective of constraints and controls on the local policy and planning process; evaluation of existing land use and related law, consideration of alternatives.

102:210 Introduction to Analytic Methods **3 s.h.**
Introduction to quantitative methods used in planning and policy analysis; emphasis on application of statistical techniques and quantitative reasoning to planning problems; use of computers to aid in data analysis.

102:211 Intermediate Analytic Methods **3 s.h.**
Intensive presentation of methods for planning analysis: sample surveys, index number construction, multiple regression, time series analysis, population and employment forecasting, economic base models, risk management, and design and evaluation of policy experiments.

102:212 Information Presentation **1-3 s.h.**
Fundamentals of presenting information effectively; emphasis on graphic display techniques, including computer applications, and acquiring personal communications skills; includes problem sets and speaking exercises.

102:215 Field Problems in Planning **3 s.h.**
Class teams of three to five students work on a semester-long project involving a current planning issue, usually for a "client" such as a city planning department; teams produce professional-quality final reports.

102:219 Practicum **3 s.h.**
Qualified full-time internship of at least five months with a planning-related organization. Open only to graduate students in urban and regional planning.

102:226 Professional Planning Practice **3 s.h.**
Current professional planning practice and skills; citizen participation requirements and techniques, researching and drafting ordinances, updating comprehensive plans, devising economic development plans, writing staff reports; taught by practicing planners.

102:230 Special Problems in Planning **arr.**
Investigation of problems of special interest to students and faculty; topics vary. May be repeated.

102:233 Land Use Controls Seminar **3 s.h.**
Traditional zoning control, flexible control and market devices, PUDs, state land use planning, critical area controls, growth management, exclusionary zoning, fair share housing, and other topics.

102:234 Project Impact Analysis **3 s.h.**
Analysis and evaluation of the economic, social, environmental, and fiscal impacts of major public and private policies or projects; includes techniques to perform analyses and evaluate effects; case studies and projects used to illustrate concepts and techniques.

102:236 Capital Facilities Planning and Finance **2-3 s.h.**
Overview of current public infrastructure problems; methods of planning size, location, and timing of utility networks and other capital facilities; municipal bond financing; service pricing; alternative institutional arrangements such as privatization and municipal enterprise. Prerequisite: 102:206 or consent of instructor.

102:242 Environmental History and Theories 3 s.h.
Historical, political, and theoretical examination of public policy toward the natural environment; assessment of the role of planners and policy analysts in guiding change in the environment; includes problem scenarios and role-playing.

102:243 Environmental Management 3 s.h.
Legislation, programs, and research efforts in environmental quality and risk; students conduct topics studies and devise alternative management strategies.

102:244 Advanced Seminar in Environmental Policy 3 s.h.
In-depth examination of current issues, approaches to problem solving, methodologies, or ethical concerns; topics vary.

102:245 Energy and Public Utility Policy and Planning 3 s.h.
Analysis and evaluation of the function and organization of public utilities; planning techniques and procedures related to regulated utilities; historic, legal, and economic background necessary for informed utility planning.

102:246 Nonpoint Pollution Policy 3 s.h.
Problems, causes, and control mechanisms; governmental strategies and programs designed to manage these impacts on environmental resources.

102:254 Introduction to Environmental Processes and Policy 1-2 s.h.
Natural processes and systems; contemporary policies and programs designed to protect environmental resources.

102:256 Introduction to Transportation Planning 1 s.h.
Foundations of transportation institutions, methods of analysis, financial principles; public policy issues.

102:257 Introduction to Housing and Community Development 1 s.h.
Foundations of institutions, methods of analysis, financing principles; review of public policy issues.

102:259 Introduction to Economic Development 1 s.h.
Methods of analyzing regional economies and evaluating economic development strategies; industrial location, regional economic models, input-output analysis.

102:260 Transportation Policy and Planning 3 s.h.
The institutional setting for transportation services and changing roles of the various levels of government; efficiency and equity impacts of alternative pricing and investment policies; financing options and user charges; theory and case studies.

102:261 Problems in Transportation and Land Use 1-3 s.h.
Individual projects on policy problems of local or state interest in Iowa, proceeding from issue identification to presentation of results to potential clients; examples include highway finance, truck user fees, inland waterway investment, cost-benefit analysis of major freeway segments, railroad branch line abandonment, and rural transit evaluation.

102:262 Urban Transportation Planning 3 s.h.
Same as 53:262.

102:263 Transportation Systems Analysis 3 s.h.
Same as 53:163.

102:264 Transportation Planning Process 2-3 s.h.
Examination of transportation planning process: technical issues, political interface, citizen involvement, intermodal questions, and public versus private roles; critiques of transportation plans.

102:265 Transportation Regulation and Finance 3 s.h.
Theories and methods of regulating and financing passenger and freight transportation; effects of deregulating surface and air transport modes, and of changing finance and pricing policies including privitization and impact fees. Same as 44:265.

102:269 Transportation Program Seminar 1 s.h.
Seminars conducted by faculty and guest speakers; topics include transportation finance, safety and economic regulation, planning processes, management, and policy issues at the federal, state, and local levels of government. May be repeated.

102:271 Urban Housing 3 s.h.
Housing finance, supply and demand analysis, production, management, design of housing, and the quality of urban residential services; historical view of housing and public policy.

102:273 Problems in Housing Policy 3 s.h.
Individual or group projects in problems relating to housing, such as affordability, needs of the homeless, public housing management, neighborhood deterioration, community development corporations, and other public policy issues.

102:274 Community Development 3 s.h.
Community and neighborhood conservation and housing rehabilitation; the role of citizen-based development organizations; creation of innovative programs; local and intergovernmental financing of community development.

102:275 Development Policy and Planning in Third World 3 s.h.
Cross-cultural and interdisciplinary analysis of problems associated with urbanization and development in Third World countries. Same as 113:275, 6E:234, 42:275, 34:275, 44:275, 7F:275.

102:290 Regional Development: Theory and Policy 3 s.h.
Methods of regional science, including input-output and econometric models; migration and multiregional demographic models; spatial interaction modeling; and interregional economic-demographic models; emphasis on theoretical foundations and on applications to forecasting and impact analysis. Same as 6E:290, 44:290.

102:291 Urban and Regional Development 3 s.h.
Urban and regional economies from a macro and sectoral point of view; survey of the major theoretical arguments and policy issues in local, regional, and national economic planning. Prerequisite: 102:206 or consent of instructor.

102:295 Economic Development Policy 3 s.h.
Analysis of policies and programs at the national, regional, state, and local levels that address problems of economic growth, development, and decline. Prerequisite: 102:206 or consent of instructor.

102:297 Problems in Economic Development 3 s.h.
Case studies of state and local economic development problems; a practicum with emphasis on an individual or group project. Prerequisites: 102:206, and 102:291 or 102:295 or consent of instructor.

102:298 Development Finance 3 s.h.
Evaluation of public policies to influence or direct the flow of capital and the nature and location of investment; how private sector financing decisions are made; alternatives such as public loan or venture capital funds, industrial development bonds, employee stock ownership plans, regional development authorities. Prerequisite: 102:206 or consent of instructor.

102:305 Readings arr.

102:315 Independent Study in Planning 3-6 s.h.
Research and analysis of a special planning problem selected by student with faculty approval; provides opportunity for student to apply knowledge in area of specialization.

102:325 Thesis: Urban and Regional Planning arr.

102:333 Program Seminar 1 s.h.

WOMEN'S STUDIES

Chair: Martha Chamallas
Professors: Florence Boos (English), Nicholas Colangelo (Counselor Education), Ursula Delworth (Psychological and Quantitative Foundations), Mary Dudziak (Law), Roslyn M. Frank (Spanish and Portuguese), Sarah Hanley (History), Linda Kerber (History, May Brodbeck Professor in the Liberal Arts), J. Kenneth Kuntz (Religion), Margaret McDowell (Rhetoric), Adalaide Morris (English), Cecilia Ridgeway (Sociology), Carol de Saint Victor (English), Margery Wolf (Women's Studies/Anthropology)
Associate professors: Florence E. Babb (Women's Studies/Anthropology), Susan J. Birrell (Physical Education and Sports Studies), N. Peggy Burke (Physical Education and Sports Studies), Carolyn Cutrona (Psychology), Carolyn Dyer (Journalism), Mary Lou Emery (English), Nancy Hauserman (Industrial Relations and Human Resources), Mae Henderson (English/African-American World Studies), Adriana Mendez Rodenas (Spanish and Portuguese), Lauren Rabinovitz (American Studies/Communication Studies), Yvonne Slatton (Physical Education and Sports Studies), Diana Vélez (Spanish and Portuguese)
Assistant professors: B. Eleanor Anstey (Social Work), James Giblin (African-American World Studies/History), Marlynne Ingram (Economics), Sally Kenney (Women's Studies/Political Science), Susan Lawrence (History/Medicine), Deborah Laycock (English), Heather MacDonald (Urban and Regional Planning), Kathleen Newman (Spanish and Portuguese), Anne Roberts (Art and Art History), Rebecca Roberts (Geography), Rebecca Rogers (History), Mary Whelan (Anthropology)

The Women's Studies Program is a multidisciplinary program focusing on the study of women in culture, society, history, and literature. Its major goal is to bring to the University community new research on women, which frequently is overlooked by traditional disciplines. By taking courses through many departments, students become acquainted with feminist scholarship and its methodologies in the humanities and the social sciences. These courses may be used to establish a field of concentration within the Women's Studies Program or to apply to majors in other disciplines.

Undergraduate Study

Undergraduates interested in women's studies may develop programs of study in relation to course work in a major, as part of an area of concentration within a Bachelor of General Studies degree, as a minor, or as a set of electives to satisfy general interest.

It is strongly recommended that students contemplating a concentration in women's studies take 131:101 Introduction to Women's Studies, including the optional semester hour associated with it.

Minor

Undergraduate students may complete a minor in women's studies by taking 15 semester hours of departmental courses associated with the program, including at least 12 semester hours taken at The University of Iowa in 100-level courses, and by maintaining a 2.00 grade-point average in these courses.

It is strongly recommended that students contemplating a minor in women's studies take 131:101 Introduction to Women's Studies, including the optional semester hour associated with it.

Graduate Study

Graduate students in master's or doctoral programs may choose a comprehensive area in women's studies within existing disciplines. Graduate students who want to pursue the Ph.D. in women's studies should file a plan of study for the ad hoc interdisciplinary Ph.D. through the Graduate

College. Students first must be granted admission by a department of the University.

Information on faculty members in various departments who direct graduate study is available from the Women's Studies Program, 202 Jefferson Building.

Associated Courses

The departmental courses listed below are associated with the Women's Studies Program and may be applied toward a concentration or a minor in women's studies.

In addition to the following courses, many departments sometimes offer additional courses focusing on women. Women's studies courses for University credit also are offered by the Saturday and Evening Class Program and by Guided Correspondence Study.

African-American World Studies

129:120 Images of Black Women in Modern American Fiction 3 s.h.
129:127 Black Women Writers 3 s.h.

American Studies

45:35 Race and Ethnicity in the U.S. 3 s.h.

Anthropology

113:132 Latin American Studies Seminar: Film and the Politics of Gender (same as 35:176) 3 s.h.

Counselor Education

7C:150 Psychological Aspects of Women's and Men's Roles 1-3 s.h.
7C:162 Introduction to Marriage and Family Counseling and Psychotherapy 3 s.h.
7C:262 Marriage and Family Counseling and Psychotherapy 3 s.h.

English

8G:15 Women and Literature 3 s.h.
8:110 Selected Authors: Woolf and Lessing 3 s.h.
8:118 Black Women Writers 3 s.h.
*8:434 Seminar: Twentieth-Century British Literature arr.

History

16:15 Problems in Human History: Women and Society in Past Times 3 s.h.
*16:139 Medicine, Science and Social Change 3 s.h.
16:210 Readings: Medieval Women 3 s.h.
16:258 Readings: Women in European History arr.

Journalism

19:281 Master's Practicum (Women and the Media)
19:381 Ph.D. Research Practicum (Women and the Media)

Law

91:307 Legal Control of Sexuality and Sexual Conduct arr.
91:350 Sex-Based Discrimination 2-3 s.h.

Psychological and Quantitative Foundations

*7P:354 Seminar: Experimental Approaches in Counseling Research

Psychology

31:116 Psychology of Sex Differences 3 s.h.

Rhetoric

*10:3 Rhetoric 4 s.h.

Spanish and Portuguese

35:246 Images of Women in Latin American Literature 3 s.h.

*Only certain sections of these courses are women's studies courses.

Courses

Core Courses

131:101 Introduction to Women's Studies 3-4 s.h.
Introduction to the feminist interdisciplinary study of women's lives, including work, family, sexuality, political and social change, race, class, sexual orientation, and cultural traditions.

131:148 Psychology of Gender 3 s.h.
Feminist theories and research on the nature of gender differences, their development, and their influence on human behavior.

131:149 International Feminism 3 s.h.
International perspective on women's social, political, and economic lives and on women's efforts to examine and challenge conditions affecting their lives.

131:150 Topics in Women's Studies 3 s.h.
Topics such as American women in the 1960s and 1970s, feminist utopias, psychoanalysis and women, women and religion in American culture.

131:151 Feminist Theory 3 s.h.
Survey of historical and contemporary feminist analyses of the position of women in culture and society; variety of theoretical approaches and political perspectives, contemporary issues, and controversies.

131:179 Independent Readings and Research in Women's Studies 1-3 s.h.
Supervised reading and research in women's studies, on a topic not covered in regular curriculum.

131:200 Seminar: Feminist Theory and Methods 3 s.h.
Contemporary feminist thinking and research on selected topics; emphasis on theory and methods. Consent of instructor required.

Cross-Listed Courses

131:15 Third World Women and Literature 3 s.h.
Lives of pioneering Third World women explored through their creative works in attempt to understand the complexity of their oppression and their heroic struggle against racism, classism, and sexism. Same as 129:15.

131:40 Gender in the U.S. 3 s.h.
Topics such as sex roles, gender relations, feminine and masculine dimensions of American culture. Same as 45:40.

131:42 Women and Work in the U.S. 3 s.h.
Women in the American workplace, pink collar, and housework; gender and the division of labor; sexual harassment; affirmative action. Same as 45:42.

131:44 Lesbian Lives in the U.S. 3 s.h.
The diversity of lesbian experience in America; focus on issues of race, class, education, family and personal relationships. Same as 45:44.

131:87 Gender Roles and Communication 3 s.h.
Analysis of research and theory on sex roles and communication processes, including the function of communication in sex role development. Same as 36C:87.

131:102 Physiological Research on Women in Sport 2-3 s.h.
Physiological capabilities, responses to training, and factors specific to pregnancy, child bearing, and gender-related injuries. Same as 28:102.

131:108 Women and Society 3 s.h.
The role and status of women in society; sex differences, sex role socialization, theories about origin and maintenance of sexual inequalities, changes in social life cycles of women, implications for social institutions and processes; focus on contemporary United States. Same as 34:108.

131:111 Religion and Women 3 s.h.
Sexism and its disavowal in biblical narrative, law, wisdom texts, Gospels, and epistles; contemporary impact. GER: humanities. Same as 32:111.

131:128 Black Women in America 3 s.h.
Position, experience, cultural interpretations, mythology, and societal roles of Black women, especially in the Caribbean and the United States, through literary, historical, sociological, psychological, and anthropological sources. Same as 129:128.

131:135 Women, Medicine, and Society 3 s.h.

131:140 The Cultures of American Women 3 s.h.
Women's experience in America with particular reference to the relationship between individual lives and broad social and cultural context. Same as 45:140.

131:145 Women and War 3 s.h.
New scholarship that challenges the traditional allocation of domestic and social history to women and political and military history to men; interdisciplinary course involving art, literature, politics, and history. Same as 16:145.

131:146 Women and the City 1-3 s.h.
How gender relations decisively affect the urban environment and shape women's decisions, including where to live and work and how to balance the demands of home; patriarchy and urban spacial structure, women's employment, child care, accessibility for women, and women and development. Same as 102:146.

131:147 Language and Gender 3 s.h.
Investigation of gender-related language variation; extensive reading and discussion of current research on gender-specific linguistic forms and usage in the United States and other language communities; introduction to relevant principles of linguistic theory and analysis. Same as 103:150, 113:173.

131:152 The Sexes and Film 3 s.h.
The position of women in Hollywood and alternative cinemas; contributions of feminist film scholars and critics to the field. Same as 36B:152.

131:153 Sociology of Women in Sport 2-3 s.h.
Feminist analysis of girls' and women's sports experiences, including socialization into sport, gender role socialization through sport, recent changes in women's intercollegiate athletics, media portrayals of women's sport, and feminist alternatives to sport. Same as 28:153.

131:156 Women's Roles in Cross-Cultural Perspective 3 s.h.
Theory and research on origins of women's oppression, current status of women, work and family roles, and links between sex, race, and class inequalities. Same as 113:156.

131:159 Regional Women Writers 3 s.h.
Writings of women whose consciousness has been shaped through association with the cultural, political, and/or linguistic pressures of a particular geographical location. Same as 8:159.

131:161 Women in Literature 2-3 s.h.
The study of women as portrayed in literature and as writers and/or readers of literature; genres, periods, and authors; feminist perspectives on the study of literature. Same as 8:161.

131:162 Women in African History 3 s.h.
Theories about the creation of patriarchy applied to Africa; initiation rituals and gender/gender roles; gender divisions of labor and historical changes in them; women in labor migration systems and their role in reproduction; women and slavery; twentieth-century women in urban and peasant societies; female prostitution; women's political movements in South Africa; the 1929 women's tax revolt in Nigeria; women and Islam. Same as 16:124, 129:162, 141:124.

131:166 Themes and Modes in Literature by Women 3 s.h.
Focus on a specific theme, such as women and sexuality, or on a particular formal mode, such as the experimental novel; topics vary. Same as 8:166.

131:168 Economic and Political Development of Women 3 s.h.
Consequences of development for women in Latin America, Africa, and Asia, and how women have responded to development; cross-cultural history and theory of development in rural and urban settings; emphasis on women's changing economic position, from subsistence societies to capitalist and socialist societies. Same as 113:138, 34:168.

131:169 Changing Concepts of Women in Literature 3 s.h.
Textual and cultural changes in concepts of women presented within and between periods of literary history; for example, changes in the novel's conventions for portraying women from the eighteenth through the nineteenth centuries, or changes in dramatic presentation of women from the Middle Ages through the Renaissance. Same as 8:169.

131:171 Women in America: Colonial Period to 1870 3 s.h.
American history through women's eyes; emphasis on interaction of biology, economics, politics, and ideology; special attention to how traditional historical generalizations change when women's experience is considered; legal history and women's education. Same as 16A:171.

131:172 Women in America: 1870-Present 3 s.h.
From passage of the Fourteenth Amendment to the present; emphasis on the suffrage movement, economic roles, and educational patterns; students may write a history of women in their own families. Same as 16A:172.

131:180 Women and the Law 3 s.h.
How laws classify, construct, and affect women; readings span subfields including criminal, family, labor, and constitutional law; selected works of feminist jurisprudence. Same as 30:174.

131:181 Society and Gender in Europe, 1200-1789 3 s.h.
How ideas about community were influenced by gender ideologies inscribed in patterns of authority-household, church, state; ranges of human endeavor—intellectual, psychological, biological; and community organization—social, economic, legal, sexual. GER: foreign civilization and culture. Same as 16E:125.

131:182 Society and Gender in Europe, 1750-1950 3 s.h.
Social structures and gender roles in modern Europe; changes in politics, social organization, the social relationship of the sexes (education, sexuality, occupation), and forms of social protest (feminism, socialism). GER: foreign civilization and culture. Same as 16E:148.

131:188 Prose by Women Writers 3 s.h.
Survey of nonfiction prose, largely contemporary; essays are read with attention to style and content to discover how writers such as Woolf, Didion, Dillard, and Walker redefine the form and tradition of the essay. Same as 8:188.

131:190 Feminist Perspectives on Biology and Culture 3 s.h.
Feminist anthropological writings on gender in past cultures; evolution and function of gendered roles, importance of gender in human evolution, beginnings of state-type societies and the subordination of women, variations in division of labor cross-culturally, biological versus culturally constructed differences between men and women. Same as 113:190.

131:194 Introduction to Feminist Criticism 3 s.h.
Survey of topics such as precursors, early formulations, debates between feminist critics, and feminist challenges to other theoretical models; for students new to the study of literary criticism and theory in general and feminist critical theory in particular. Same as 8:194.

131:210 Seminar: Gender in Chinese Society 3 s.h.
Gender, ideology and behavior in China in the context of family, work, sexuality. Same as 113:210, 39:210.

131:220 Seminar: Feminist Anthropology 3 s.h.
Contemporary and traditional anthropological issues from a feminist perspective. Prerequisite: background in feminist theory and in anthropology. Same as 113:220.

131:240 Women and Television in American Culture 3 s.h.
Relationships posited between women and television through feminist critical scholarship and cultural analysis. Same as 36B:240, 45:240.

131:254 History of Women in Sports 2-3 s.h.
Women's sport involvement from ancient times to the present; focus on social class, attitudes, religion, race, ethnicity, medical opinion, economic considerations, political events, and educational philosophies that have influenced women's sports participation. Same as 28:254.

131:265 Feminist Criticism 3 s.h.
Organized around a central topic such as new French feminisms, Marxist feminisms, or feminism and popular culture; for graduate students who have done substantial work in literary criticism in general and at least some preliminary work in feminist criticism in particular. Same as 8:265.

131:269 Feminist Legal Thought 3 s.h.
Contemporary feminist critiques of legal doctrine, analysis and method; redefinition of legal problems through application of diverse feminist approaches; interdisciplinary comparison of feminist legal thought to feminist scholarship in the social sciences and humanities. Same as 91:269.

131:270 Readings in American Women's History arr.
Extensive reading in the older literature of American women's history as well as the great body of work of the last decade; focus on the use of gender as an analytical device, the changing social relations of the sexes over long periods of time, the concept of separate spheres, sex segregation in the workplace, gender and deviance, feminism and politics, women's history as intellectual history. Same as 16:270.

131:273 Women and Social Change: International Development Perspectives 3 s.h.
Women's social, political, and economic lives in response to development in Africa, Latin America, Asia, and the United States; interdisciplinary approach. Consent of instructor required. Same as 42:273.

131:283 Feminist Theory: Historians' Perspectives arr.
Same as 16:283.

131:284 Seminar: History of American Women arr.
Same as 16:284.

Research at Iowa Lakeside Laboratory

College of Business Administration

Accounting students' Volunteer Income Tax Assistance Program

Dean: George Daly
Acting senior associate dean: Gary C. Fethke
Associate deans: Willis R. Greer, Jr., Duane E. Thompson
Assistant deans: Myron P. Mustaine, Jr., Nancy C. Noth (acting)
Degrees offered: B.B.A., M.B.A., M.A., Ph.D.

The College of Business Administration is made up of six academic departments: accounting, economics, finance, management and organizations, management sciences, and marketing.

The undergraduate and graduate programs of the college are accredited by the American Assembly of Collegiate Schools of Business.

Research, executive development, and continuing education activities are supported by the external agencies of the college: Executive Development Center, Financial Markets Institute, Industrial Relations Institute, Institute for Economic Research, Management Center, Manufacturing Productivity Center, Institute for Entrepreneurial Management, Ira B. McGladrey Institute for Accounting Research, and Small Business Development Center.

Undergraduate Program

Bachelor of Business Administration

The college offers the Bachelor of Business Administration (B.B.A.) degree in all six departments and in business administration. B.B.A. students complete background studies either in the College of Liberal Arts at The University of Iowa or at another institution and usually enter the College of Business Administration as juniors.

The college's B.B.A. curriculum requires 120 semester hours for graduation, with at least 48 semester hours in business courses and at least 48 in nonbusiness courses. Limited specialization is effected through the student's designated major.

The last 30 (or 45 of the last 60) semester hours must be earned in residence following admission to the College of Business Administration. At least 24 semester hours of credit in courses offered by the College of Business Administration and at least two-thirds of the semester hours of credit in the student's major must be earned at The University of Iowa. Nonresident instruction includes course work at colleges and universities other than The University of Iowa and all work by correspondence, including University of Iowa Guided Correspondence Study courses.

To graduate, B.B.A. candidates must have at least a 2.00 grade-point average in all college course work, in all course work attempted at The University of Iowa, in all business course work attempted, in all business course work attempted at The University of Iowa, in all course work attempted in the major, and in all course work attempted at The University of Iowa in the major.

Common Requirements

B.B.A. candidates must satisfy these minimum common requirements or equivalents:

Rhetoric 10:1 and 10:2, or 10:3	4-8 s.h.
22M:17 and 22S:8 Quantitative Methods I and II or 22M:25, 22M:26, and 22S:120	6-8 s.h.
6E:1 Principles of Microeconomics	3-4 s.h.
6E:2 Principles of Macroeconomics	3-4 s.h.
6A:1 Introduction to Financial Accounting	3 s.h.
6A:2 Managerial Cost Accounting	3 s.h.
Natural science (excluding math)	3 s.h.
Historical perspectives (3-6 s.h.)	
Foreign civilization and culture (0-3 s.h.)	6 s.h.
Humanities (including 8G:1 Interpretation of Literature)	6 s.h.
Social sciences (excluding 6E:1 and 6E:2)	6 s.h.
Computer analysis (6K:70, 22C:7, 22C:9, or 22C:16)	3 s.h.
6K:71 Statistical Analysis	3 s.h.
6J:47 Introduction to Law	3 s.h.
6J:100 Administrative Management	3 s.h.
6F:100 Introductory Financial Management	3 s.h.
6M:100 Introduction to Marketing	3 s.h.
6B:165 Business Policy	3 s.h.

In addition, students must complete a major area of study. The majors offered by the college are business administration, accounting, economics, finance, industrial relations and human resources, management sciences, and marketing. With the exception of the major in business administration, the requirements for each are established by the departments of the college.

Major in Business Administration

This major permits students to pursue a less specialized curriculum than is provided by any of the other majors in the college. It also allows students to concentrate in areas in which majors are not available but in which courses are offered in departments within the college (e.g., international business).

The requirements for the major in business administration are as follows.

Six business courses (18 s.h.) numbered above 100, including at least four of these:

6A:113 Taxes and Business Decisions
6E:103 Microeconomics
6F:117 Intermediate Financial Management
6J:158 Personnel Management
6J:161 Individual Behavior in Organizations
6K:180 Management Information Systems
6M:134 Marketing Research

In addition to the required grade-point averages listed above, students in this major must have a grade-point average of at least 2.00 on all courses taken from the list above and on all business courses numbered above 100. Students in this major may not take business courses numbered above 100 pass/nonpass.

Students majoring in business administration may substitute 6K:84 Production Management for 6J:100 Administrative Management.

The business administration major may not be combined with any other business major.

Minors

Nonbusiness Minors

Undergraduate students in the College of Business Administration may elect to complete a minor in another college of the University. For example, students interested in international business might choose a foreign language as a minor. For the minor requirements, students should consult with an adviser in the relevant department. To have the minor recorded on their transcript, students must complete the "minor" section on the B.B.A. degree application form before submitting it to the registrar early in the final semester.

Business Minor

Students majoring in another college of the University may elect a minor in business administration. The courses listed below, or their equivalents, satisfy all requirements for the minor. At least 15 semester hours of courses taken for the minor must be completed in residence at The University of Iowa. A grade-point average of at least 2.00 is required on all courses taken for the minor and on all of these courses taken at Iowa. Courses for the minor may not be taken P/N.

A computer programming course	3 s.h.
Business calculus (22M:17, 22M:25, or 22M:35)	3-4 s.h.
Statistics (22S:8 or 22S:120)	3-4 s.h.
6E:1 Principles of Microeconomics	3-4 s.h.
6E:2 Principles of Macroeconomics	3-4 s.h.
6A:1 Introduction to Financial Accounting	3 s.h.
6A:2 Managerial Cost Accounting	3 s.h.
*6F:100 Introductory Financial Management	3 s.h.
6J:47 Introduction to Law	3 s.h.
*6J:100 Administrative Management	3 s.h.
*6M:100 Introduction to Marketing	3 s.h.

*Must be taken in junior or senior year

Students who will have completed all requirements for the minor in business administration when they graduate should indicate a business minor on the application for degree card, which is filed at the Registrar's Office early in the student's final semester.

Recognition for Academic Achievement

Dean's List

Students who achieve grade-point averages of 3.50 or higher on 12 or more semester hours of graded work during a given semester and who have no hours of I or 0 are recognized by inclusion on the dean's list for that semester.

President's List

Students who earn a 4.00 grade-point average for two consecutive semesters (excluding summer sessions) on at least 12 or more semester hours of graded work each of the two semesters, and who have no hours of I or 0 those semesters, are recognized by inclusion on the president's list.

Honors

The College of Business Administration Honors Program provides outstanding students in the college the opportunity to undertake advanced work and independent study in their majors and to work closely with faculty and other honors students. Its purpose is to challenge superior students to reach their academic potential. All juniors and seniors in the program participate in a collegewide honors seminar. Successful completion of departmental and college requirements leads to a Bachelor of Business Administration degree with honors (see "Graduation Honors," below).

Prebusiness students interested in the honors program are encouraged to participate in the College of Liberal Arts Honors Program until they are admitted to the College of Business Administration. This permits them to take advantage of the services offered by the Shambaugh House Honors Center. They also are encouraged to join the Association of Iowa Honors Students, which plans a variety of social and educational activities each year.

Students should apply for admission to the College of Business Administration Honors Program when they apply for admission to the college, and they must apply no later than the first semester of the junior year. For more information, students should contact the Academic Programs Office, 121 Phillips Hall.

Graduation Honors

High scholastic achievement is recognized in two ways upon graduation: graduation with distinction based on grades only, and graduation with honors in business administration based on both grades and the completion of special work as outlined by the college.

To be eligible for either form of recognition, a student must complete 60 semester hours in residence as an undergraduate at The University of Iowa; at least 45 semester hours must be completed prior to the final registration.

Graduation with Distinction

The Office of the Registrar certifies to the dean of the college the names of students eligible to graduate with distinction. The college awards degrees "with highest distinction" to students in the highest two percent of the graduating class, "with high distinction" to students in the next highest three percent, and "with distinction" to the next highest five percent. Ranking is based on students' grade-point averages for all college-level study undertaken prior to their final registration.

Admission

The college admission standards are set by the undergraduate program committee. The college usually admits undergraduate students at the beginning of their junior year. Students are eligible for admission to the college after they have completed 60 semester hours; have satisfied the common requirements in quantitative methods, accounting, and economics with a grade-point average of at least 2.25 on the courses used to satisfy these requirements, on all college-level courses taken, and on all courses undertaken at The University of Iowa; and have submitted an application by the deadline (May 1 for summer or fall admission, December 1 for spring admission).

The College of Business Administration considers the following factors in a comparative evaluation of applicants for admission:

Grade-point averages on all college work completed (including transfer), all work completed at The University of Iowa; and the prerequisite courses in quantitative methods, economics, and accounting;

The pattern of grades over time; and

Other factors relevant to predicting success in the college.

The exact standards (e.g., grade-point average) each semester vary with the number of applicants, their relative qualifications, and College of Business Administration enrollment limits. Since these standards change from time to time, the college provides information about the characteristics of the students admitted. This permits those interested in the program to judge how they are progressing toward admission.

No more than 60 semester hours, or equivalent, of transfer credit is accepted for students transferring from a two-year institution. Transfer credits for business courses taken during the freshman and sophomore years are counted toward the B.B.A. degree only if such courses are usually offered as lower-division courses at The University of Iowa.

Credit and Grading

Credit by Examination

Students may earn up to 32 semester hours of credit by examination. Selected tests from the College-Level Examination Program (CLEP) of the College Entrance Examination Board are used. It is possible to receive credit for some of the common requirements of the college. Information on the CLEP examinations is available from the Liberal Arts Office of Academic Programs.

Maximum Schedule

Course schedules of more than 18 semester hours for a semester or 9 semester hours for a summer session require approval of the dean.

Adding and Dropping Courses

Courses may be added during the first three weeks of the semester or first one and one-half weeks of the summer session with approval of the adviser and instructor. Courses may be dropped during the first ten weeks of the semester or first five weeks of the summer session with approval of the adviser and instructor. Students must have the approval of the dean in order to add or drop a course after these deadlines. Approval for adds or drops after these deadlines is granted only in extraordinary circumstances.

Undergraduates will receive the mark of W for any course dropped after the third week of the semester or first one and one-half weeks of the summer session.

Pass/Nonpass

Of the total semester hours required for a B.B.A. degree, up to 16 may be taken on a pass/nonpass basis with the consent of the adviser and instructor. However, students may not count more than 8 semester hours of pass/nonpass credit in the last 60 semester hours of course work. Students must be in good academic standing to be eligible for the pass/nonpass option. A maximum of two pass/nonpass courses may be taken in one semester.

Courses taken pass/nonpass may not be used to satisfy general education, common, or major business requirements. Pass/nonpass registration must be completed during the first three weeks of a semester or the first one and one-half weeks of a summer session. For courses taken on a pass/nonpass basis, an earned grade of C- or above is recorded as a P; an earned grade of D+ or below is recorded as an N.

Second-Grade-Only Option

This option is not available to students admitted to the college for spring 1990 or thereafter.

Students admitted to the college prior to spring 1990 may elect to repeat a course with only the second grade being computed in the grade-point average, except in cases of regression. Regression occurs when a student takes a lower level course after having completed a more advanced course for which the lower level course was a

prerequisite. Regression voids the possibility of the second-grade-only option.

For students admitted to the University prior to summer session 1987 and to the college before spring semester 1990, this option may be applied to a maximum of 16 semester hours of course work.

For students admitted to the University for summer session 1987 and to the college before spring semester 1990, this option is limited to a maximum of three courses.

The second-grade-only option is applicable only to courses taken both times at The University of Iowa for a standard letter grade. It may be used only once per course.

Students who want to use the second-grade-only option rule should register in the usual manner for the course they decide to repeat, or add it during the regular period for adding courses (the first three weeks of the semester). They must declare their intent to use the option by reporting to the Academic Programs Office, College of Business Administration, 121 Phillips Hall. This must be done by the end of the third week of the semester (or first one and one-half weeks of the summer session). Liberal arts prebusiness majors must adhere to second-grade-only option procedures and deadlines set by the Liberal Arts Office of Academic Programs, 116 Schaeffer Hall.

Under the provisions of this option, the registrar marks the permanent record to show that a particular course has been repeated. Both grades remain on the permanent record, but only the second one is used in calculating the grade-point average and hours earned.

The standard procedure of counting both grades in instances where students repeat a course is continued unless students follow the above procedure.

Correspondence Course Work

B.B.A. candidates may not satisfy any requirement, general education, common, or major, through correspondence courses.

Probation and Dismissal

Students are placed on academic probation when their grade-point average in any of the following categories falls below 2.00: all course work undertaken, all course work undertaken at The University of Iowa, all business course work undertaken, all business course work undertaken at The University of Iowa, all course work taken to satisfy requirements for the major, and all course work taken at The University of Iowa to satisfy requirements for the major.

When all of the above grade-point averages equal or surpass 2.00, students are removed from probation. Usually, students are allowed only one session to return to good academic standing. Students on academic probation who withdraw registration after the deadline for dropping courses are automatically dismissed.

Students may be dismissed from the college at any time for unsatisfactory scholarship. While some probationary period usually precedes a dismissal, even students in good academic standing who complete a term with extremely unsatisfactory grades may be dismissed immediately. Students dropped from the college for poor scholarship may petition for permission to reregister, but usually only after the expiration of one calendar year following the end of the term in which the dismissal took place.

International Business Certificate

The College of Business Administration and the College of Liberal Arts offer a joint program leading to a Certificate in International Business. This program entails study of international business and economics, international relations and institutions, a foreign language, and related area studies.

It has been designed not only for undergraduate students who intend to pursue careers in international business but for any undergraduate interested in gaining a better understanding of the global economy and a broader awareness of the political, historical, and social environment in which international business operates. The range of electives in the program permits students to tailor areas of specialization suited to their individual interests and to complement majors in both liberal arts and business administration.

Completion of requirements results in the notation "Certificate in International Business" on the student's transcript. Questions should be directed to the Office of Academic Programs, College of Business Administration, 121 Phillips Hall.

Application Information

Interested students must declare their intention to pursue the certificate and file a plan of study at the Academic Programs Office, 121 Phillips Hall. In order to receive the International Business Certificate, students must receive an undergraduate degree from The University of Iowa, maintain a minimum 2.00 grade-point average on all course work taken for the certificate, and take at least 20 semester hours of course work (other than language) for the certificate at The University of Iowa or in approved study-abroad programs. A course may not be used to satisfy more than one certificate requirement.

Requirements

International Business

6E:1 Principles of Microeconomics
6E:2 Principles of Macroeconomics

Three courses in international business

International Relations and Institutions

Two courses in international relations and institutions

Foreign Language and Related Area Studies

Two to three years of college-level work (or equivalent) in one of the following languages: Chinese, French, German, Hindi, Italian, Portuguese, Russian, or Spanish

Two courses that pertain to countries or areas in which the chosen language is spoken

A complete listing of courses satisfying the above requirements is available from the Academic Programs Office, 121 Phillips Hall.

Interdepartmental Graduate Programs

The following interdepartmental graduate programs are offered in the College of Business Administration: Master of Arts (M.A.) in business administration, Master of Business Administration (M.B.A.), and Doctor of Philosophy (Ph.D) in business administration. Joint degree options allow M.A. in business administration or M.B.A. candidates to pursue a second graduate degree in another college. For information on the Master of Arts (M.A.) in accounting, see "Accounting" in this section of the *Catalog*. For information on graduate programs in economics, see "Economics" in this section of the *Catalog*.

Master of Business Administration

The Master of Business Administration (M.B.A.) program is designed to prepare students for professional administrative careers in the business or public sector. The program enhances students' career opportunities and provides the commercial and government sectors with the professional personnel needed in a complex, modern economy.

The curriculum is designed for college graduates in any field. Previous courses in business are not required for admission. Depending on the student's undergraduate academic background, 38 to 60 semester hours are required. Some of the ten foundation courses may be waived on the basis of proficiency examinations or equivalent course work of high quality taken as part of an undergraduate degree program. A minimum of 24 semester hours of 200-level courses must be completed in residence at The University of Iowa after admission to the M.B.A. program.

Accelerated Professional Track

Highly qualified undergraduate students in the Colleges of Liberal Arts or Engineering at The University of Iowa may be admitted to the Accelerated Professional Track (APT) program toward the M.B.A. degree. These

students can take the M.B.A. foundation courses as electives in their undergraduate program so that they can earn both the bachelor's and M.B.A. degrees in less time than would usually be required. APT students also agree to have a cooperative education experience in industry while in the program.

Interested engineering students should have completed two years of engineering study, earned a 3.50 grade-point average or better, and indicated the intent to pursue both degree programs on a full-time basis. Liberal arts students should have completed at least 60 semester hours of course work in that college with a grade-point average of 3.50 or higher. Further information on the APT program is available from the Academic Programs Office, 121 Phillips Hall.

Foundation Courses

6N:190 Consumer and Firm Behavior—M.B.A.	3 s.h.
6N:191 National Income Analysis—M.B.A.	3 s.h.
6N:192 Financial Accounting—M.B.A.	3 s.h.
6N:193 Computer Methods—M.B.A.	1 s.h.
6N:194 Managerial Finance—M.B.A.	3 s.h.
6N:196 Marketing Management—M.B.A.	3 s.h.
6N:197 Quantitative Methods—M.B.A.	3 s.h.
6N:201 Managerial Communications—M.B.A.	1 s.h.
6N:202 Information Retrieval—M.B.A.	1 s.h.
6N:258 Human Resources Management—M.B.A.	3 s.h.
Total	24 s.h.

Integrated Core

In the M.B.A. integrated core courses, students continue the broad study begun in the sequence of foundation courses listed above and pursue more advanced study associated with their own career objectives.

All students take each of these:

6N:214 Managerial Accounting—M.B.A.	3 s.h.
6N:261 Administrative Science I—M.B.A.	3 s.h.
6N:208 Society, Law, and Business—M.B.A.	3 s.h.
6N:265 Strategic Management and Business Policy—M.B.A.	3 s.h.
6N:271 Statistical Methods—M.B.A.	3 s.h.
6N:273 Managerial Economic Theory—M.B.A.	3 s.h.
6N:276 Operations Research—M.B.A.	3 s.h.
Total	21 s.h.

Electives

The student chooses 15 semester hours of electives, which must be approved by the Academic Programs Office.

Off-Campus M.B.A.

Courses are offered during evening hours in Cedar Rapids and the Quad Cities. This program is sponsored jointly by the College of Business Administration and the Division of Continuing Education. In Cedar Rapids, these courses are offered in conjunction with the Continuing Education Association, and in the Quad Cities with the Quad Cities Graduate Study Center in Rock Island, Illinois.

Students pursuing the degree in the evening usually take two courses each semester and are able to complete the program in four years.

A limited number of M.B.A. courses are offered in Iowa City during the evening. All students admitted to the M.B.A. program may take classes on a part-time basis during the day.

Special M.B.A. Programs

A special program, the Executive M.B.A., also leads to the Master of Business Administration degree. Admission is limited to experienced executives who want to broaden their management skills without interrupting their professional careers. Course work is presented in two academic years. Classes begin with one full week in Iowa City followed by classes one day a week on alternating Fridays and Saturdays. Participants progress through the program together as a single group. Enrollment is limited to 30 students per year.

Information about the program, fees, and application procedures may be obtained by writing or calling the Academic Programs Office, College of Business Administration.

Master of Arts

The Master of Arts degree program in business administration is designed for students seeking specialization in one of several areas of business administration. It permits a research emphasis that qualifies students for research or teaching positions or employment in business.

The program is available with or without thesis and is flexible, permitting specialization according to students' interests and objectives. Students may select a major in finance, management and organizations, and management information systems. The minor may be developed from approved course combinations within the College of Business Administration or from outside the college.

All students in the M.A. program must satisfy the common body of knowledge requirement of the American Assembly of the Collegiate Schools of Business (AACSB). This means that candidates' undergraduate or graduate course work must include study in accounting, quantitative methods, organizational behavior, management, finance, marketing, and the economic and legal environment pertaining to profit and/or nonprofit organizations.

Requirements for the M.A. degree with thesis include the following.

Major area	9 s.h.
Minor area	6 s.h.
Economic theory and/or organizational behavior	6 s.h.
Electives	6 s.h.
Thesis	3 s.h.
Total	30 s.h.

Requirements for the M.A. degree without thesis include the following.

Major area	12 s.h.
Minor area	6 s.h.
Economic theory and/or organizational behavior	6 s.h.
Electives	6 s.h.
Research methodology	3 s.h.
Two research reports	2 s.h.
Total	35 s.h.

In either program at least 16 semester hours of course work must be taken at the 200 (graduate) level. Additional course work beyond the minimum semester hours may be required in order to meet the prerequisites for graduate courses in a major or minor area of study.

Students in the thesis program are expected to defend the thesis in an oral examination and may be required to take a written and/or oral comprehensive examination covering course work. A final oral examination is required in the nonthesis program.

A nonthesis M.A. degree in management and organizations also is available. Its requirements, which vary somewhat from those of the M.A. without thesis in other departments, are as follows.

Major area	18 s.h.
Foundation courses	12 s.h.*
Business electives	6 s.h.*
Research methodology	3 s.h.
Two research reports	2 s.h.
Total	35-41 s.h.

*Maximum—a total of 6 semester hours may be waived with appropriate undergraduate preparation. The 35-41 semester hours are inclusive of all common body of business knowledge requirements mandated by the American Assembly of the Collegiate Schools of Business (AACSB).

Doctor of Philosophy

The Ph.D. program in business administration is designed for students preparing for research positions in business and government, or for research and teaching positions at academic institutions. The program is flexible, permitting students to choose an area of specialization according to their interests. Sufficient course work and related experience are provided so that students achieve competence in economic theory, statistical methods, teaching, and/or research, as well as expertise in a major and minor area of study.

Course work in the Ph.D. program consists of prerequisites (as necessary), the Ph.D. core, major and minor areas of study, and dissertation research. Most students (including all with master's degrees from AACSB-accredited programs) take 60 semester hours of course work. Additional course requirements may be imposed to guarantee satisfaction of business prerequisites or the Graduate College minimum total credit hour requirement (72 semester hours of graduate credit, including courses taken before entering The University of Iowa Ph.D. program).

Prerequisite Courses

The common body of knowledge requirements of the AACSB must be satisfied by undergraduate or graduate courses. These include courses in accounting, finance, management, marketing, organizational behavior, quantitative methods, and the economic and legal environment pertaining to profit and/or nonprofit organizations.

Core Courses

Core courses are designed to develop competence in research and to provide necessary background for study in more specialized courses. Graduate courses are required as follows: behavioral sciences (3 semester hours), economics (6 semester hours), issues in scientific inquiry (3 semester hours), and research methods/statistics/quantitative analysis (12 semester hours).

To reflect the background and interests of individual students, doctoral candidates consult with their advisers to establish satisfaction of core requirements.

Major Area of Study

A minimum of 12 semester hours of approved doctoral-level courses must be completed in one of the following areas: accounting, finance, human resources management, industrial relations, insurance, management science, marketing, or organizational behavior.

Minor Area of Study

A minimum of 9 semester hours of doctoral-level courses beyond the Ph.D. core course requirements must be taken. Available areas include all major areas of study listed in addition to concentrations outside the College of Business Administration.

Comprehensive Examinations

Students must successfully complete a written examination in both the major and minor areas of study. The examination committee is made up of a minimum of three faculty members.

Upon satisfactory completion of the written comprehensive examinations, students must pass an oral comprehensive examination encompassing subject matter in the major, minor, and related areas. The examination committee is made up of at least five faculty members.

Dissertation

A dissertation proposal must be presented before a forum attended by dissertation committee members and open to interested faculty and graduate students as established by departmental procedures. Students are required to complete 15 semester hours of dissertation credit. The completion of research and writing associated with the dissertation usually requires one year of full-time effort.

Final Examination

The completed dissertation must be defended in an oral examination attended by the dissertation committee members. It also is open to other interested faculty and graduate students.

Admission

Applicants seeking admission to graduate study in business must submit the Graduate College application form and fee, official transcripts of all graduate and undergraduate course work, and official Graduate Management Admission Test (GMAT) scores to the Office of Admissions in Calvin Hall. Three letters of recommendation from former instructors or employers should be submitted to the Academic Programs Office, College of Business Administration.

Graduate Record Examination (GRE) Aptitude Test scores may be submitted in place of GMAT scores in applications for the Ph.D. program in business administration. See the "Graduate College" section of the *Catalog* for more information.

Application Information

A graduate application packet may be obtained from the Office of Admissions, Calvin Hall, The University of Iowa, Iowa City, Iowa 52242.

A complete application file requires the following:

- A completed application form and fee submitted to the Office of Admissions, Calvin Hall, The University of Iowa, Iowa City, Iowa 52242;
- Official transcripts of all undergraduate and graduate work submitted to the Office of Admissions by each institution attended;
- Official Graduate Management Admission Test (GMAT) scores submitted to the Office of Admissions; and
- At least three references from former instructors or employers submitted to the Academic Programs Office, College of Business Administration, The University of Iowa, Iowa City, Iowa 52242.

Foreign nationals (for whom English is not the primary language) must submit an official score of 600 or more on the Test of English as a Foreign Language (TOEFL).

Application Deadlines

The application deadlines for M.B.A., M.A. in business administration, and Ph.D. in business administration are as follows.

M.B.A. Program (Fall and Spring Entrance Only)

March 1—Foreign applicants for fall (August) or spring (January). January is the latest acceptable GMAT test date.

July 1—U.S. citizens and permanent residents applying for fall (August) enrollment. June is the latest acceptable GMAT test date.

November 15—U.S. citizens and permanent residents applying for spring (January) enrollment. October is the latest GMAT test date.

M.A. in Accounting or Business Administration (Summer, Fall, and Spring Entrance)

February 1—Foreign applicants for summer or fall who are applying for financial assistance from The University of Iowa.

March 1—Foreign applicants for summer or fall who are not seeking financial assistance from The University of Iowa.

May 1—U.S. citizens and permanent residents applying for summer enrollment.

July 15—U.S. citizens and permanent residents applying for fall enrollment.

October 1—Foreign applicants applying for spring enrollment.

December 1—U.S. citizens and permanent residents applying for spring enrollment.

Ph.D. in Business Administration (Summer, Fall, and Spring Entrance)

February 1—Foreign applicants for summer or fall who are applying for financial assistance from The University of Iowa.

March 1—Foreign applicants for summer or fall who are not applying for financial assistance from The University of Iowa.

March 1—U.S. citizens and permanent residents applying for summer or fall enrollment. Applications received by February 1 receive priority in consideration for financial aid.

October 1—Foreign applicants for spring.

October 1—U.S. citizens and permanent residents applying for spring enrollment.

Joint Programs

Joint programs allow students to pursue concurrently an M.A., M.B.A., or Ph.D. in the College of Business Administration and a J.D. in the College of Law, an M.A. in library and information science in the School of Library and Information Science, an M.A. in nursing in the College of Nursing, or an M.A. in hospital and health administration in the College of Medicine. Such programs allow students to earn both degrees more rapidly by counting a portion of their graduate course work toward both.

Other Graduate Programs

M.A. in Accounting

See "Accounting" in this section of the *Catalog*.

M.A. and Ph.D. in Economics

See "Economics" in this section of the *Catalog*.

Facilities

The College of Business Administration is located in Phillips Hall. The building contains seminar and conference rooms, a computer laboratory, an auditorium, the Business Library, and a wide range of classroom facilities.

Extensive research materials for business and economics are maintained in the Main Library, and the facilities of the Weeg Computing Center are available to all students. Additionally, students have direct access to a complete computer laboratory within the college. The laboratory serves the instructional programs of the college, and the staff maintains a current library of computational programs and data tapes to service user needs.

External Programs

Executive Development Center

The Executive Development Center conducts training and developmental conferences for executives and senior-level management personnel in Iowa, the Midwest, and the nation. The programs, ranging from two days to two weeks, offer the latest research and strategy-based knowledge in the functional aspects of business as well as the economic, social, and international issues and forces that affect American business and industry. In addition to these public programs, specially tailored executive programs are offered for particular industries and/or businesses.

Financial Markets Institute

The Financial Markets Institute has two primary objectives. The first is to disseminate recent advances in knowledge about the operation of financial markets to the academic and financial communities. The second is to support basic research that investigates the risks and returns of financial assets and the trading environment in which these assets are exchanged.

Industrial Relations Institute

The Industrial Relations Institute is designed to bring faculty and students together with people in industrial relations to explore curriculum matters and do research. It also conducts continuing education seminars and workshops for practitioners in the field of industrial relations.

Institute for Economic Research

The Institute for Economic Research engages in continuing economic research and establishes a formal mechanism for providing interaction with and economic advice to industry and government. The institute's main objectives are to provide economic information, service, and advice on a continuous basis to business and public agencies; to provide a state focal point for applied economic research; and to promote and enhance academic research and teaching in economics.

Institute for Entrepreneurial Management

The Institute for Entrepreneurial Management helps and guides potential and present entrepreneurs in planning, evaluating, and starting new business ventures. It offers individual counseling and the participation of graduate students guided by faculty members in projects such as assessing the size and viability of a market, producing pro forma financial statements, and writing the business plan. The institute also offers noncredit courses on how to manage the entrepreneurial process.

Management Center

The Management Center is a major continuing education branch of the college that provides relevant information to management and government representatives in Iowa. It disseminates current administrative, behavioral science, and management knowledge related to the working life of people in organizations through on- and off-campus conferences.

Manufacturing Productivity Center

The Manufacturing Productivity Center facilitates contractual arrangements with Iowa manufacturing firms. The agreements enable business faculty and graduate students, working with the firms' managers and engineers, to jointly address ways to improve manufacturing productivity.

Ira B. McGladrey Institute for Accounting Research

The Ira B. McGladrey Institute for Accounting Research facilitates efforts of the college's accounting faculty by providing staff and financial support.

Small Business Development Center

The Small Business Development Center was created in 1981 to provide management assistance without charge to small business owners and persons interested in starting a small business. The center provides individual counseling to small businesses and conducts workshops on topics related to small business management.

Placement Services

The placement needs of the college are served by the Office of Business and Liberal Arts Placement, located in Phillips Hall. A placement media library, student career planning advising, and interview facilities provide students and recruiting organizations with a full range of placement services.

Alumni Relations

The college maintains an Office of Alumni Relations to act as host during visits from alumni, friends, recruiters, and others interested in the college.

Interdepartmental Courses

For Undergraduates

6:000 Cooperative Education Internship **0 s.h.**

6B:000 Cooperative Education Internship **0 s.h.**

6B:165 Business Policy **3 s.h.**
Responsibilities of general managers; functional aspects of business integrated through problem-solving.

6B:188 Honors Project **arr.**
Independent research project for seniors in business administration. May be repeated.

6B:189 Undergraduate Honors Seminar **1 s.h.**
Presentation and discussion of business honors projects. Open only to business administration honors students. May be repeated.

For M.B.A. Students

See individual department listings for additional M.B.A. courses.

6N:000 Cooperative Education Internship—M.B.A. **0 s.h.**

6N:190 Consumer and Firm Behavior—M.B.A. **1-3 s.h.**
Models of consumer and firm behavior with applications; market equilibrium and market structure.

6N:191 National Income Analysis—M.B.A. **1-3 s.h.**
Measurement of economic activity; determinants of national income; investment and business fluctuations; money, prices, and inflation; monetary and fiscal policy.

6N:192 Financial Accounting—M.B.A. **1-3 s.h.**
Survey of current practice and thought relating to external reporting by a firm to its investors; rationale and

criticisms of current external reporting methods and their alternatives; primarily for students without undergraduate accounting. Not open to undergraduate business majors.

6N:193 Computer Methods—M.B.A. 1 s.h.
Use of computers in management; computer applications; programs such as spreadsheets, graphics, and database management systems; hands-on experience.

6N:194 Managerial Finance—M.B.A. 1-3 s.h.
Goals of financial management, characteristics of financial instruments and markets, cost of funds and allocation of resources, working capital management.

6N:196 Marketing Management—M.B.A. 1-3 s.h.
Marketing's relationship to business and society, environmental influences on marketing, strategic and tactical decisions faced by the marketing manager.

6N:197 Quantitative Methods—M.B.A. 1-3 s.h.
Quantitative methods applicable to business and economic problems; calculus, linear algebra, examples in production, marketing, finance, and management.

6N:201 Managerial Communications—M.B.A. 1 s.h.
Audience analysis, structure, and style in professional writing and oral presentations.

6N:202 Information Retrieval—M.B.A. 1 s.h.
Construction of bibliographies and abstracts from computer-based sources and CD-ROM; data extractions and manipulations from electronic and paper-based business sources.

6N:208 Society, Law, and Business—M.B.A. 3 s.h.
Interrelationship of business, law, and society; legal concepts that reflect societal norms and ideals and their impact on business; modes of legal thought useful in management.

6N:214 Managerial Accounting—M.B.A. 3 s.h.
Internal financial information systems; accounting information surveyed and analyzed in context of management decision systems and models; relevant economics, behavioral sciences, and quantitative analyses employed as basis for assembly and display of accounting data. Offered spring semesters. Prerequisite: 6N:192.

6N:258 Human Resources Management—M.B.A. 1-3 s.h.
Role of human resources in organizations and the economy; selected personnel theories and research applied to organizational problems such as selection, training, performance evaluation, compensation, and employment rights.

6N:261 Administrative Science I—M.B.A. 3 s.h.
Goals, concepts, and research findings in motivation, learning, perception, attitudes and attitude change, social exchange, influence, thinking, and problem solving considered in-depth.

6N:265 Strategic Management and Business Policy—M.B.A. 3 s.h.
Decision-making responsibilities of general managers; focus on strategic analysis, strategy formulation, and implementation issues; case studies and projects. Prerequisites: 6N:194 and 6N:261.

6N:271 Statistical Methods—M.B.A. 3 s.h.
Classical and Bayesian approaches to decisions under uncertainty; applications of probability modes, estimation, hypothesis testing, and regression analysis. Prerequisite: 6N:197.

6N:273 Managerial Economic Theory—M.B.A. 3 s.h.
Economic analysis applied to business problems; estimation of demand, analysis of production, pricing, investment analysis in situations characterized by risk. Prerequisite: 6N:271.

6N:276 Operations Research—M.B.A. 3 s.h.
Development and use of mathematical models to assist managerial decision making; topics include issues of resource allocation, inventory management, production scheduling, customer service channel facilities, and forecasting; optimization models and descriptive decision models. Prerequisite: 6N:271.

ACCOUNTING

Head: Valdean C. Lembke
Professors: Daniel W. Collins (Henry B. Tippie Professor), John C. Fellingham (Ernst & Whinney Professor), Valdean C. Lembke
Professor emeritus: B.L. Barnes
Associate professors: C. Edward Arrington, Douglas V. De Jong, Jere R. Francis, Richard A. Grimlund, W. Bruce Johnson, Albert A. Schepanski
Assistant professors: Ramamurthy Balakrishnan, Thomas J. Carroll, Thomas J. Linsmeier, Richard M. Tubbs, Richard A. Young
Undergraduate degree offered: B.B.A. in Accounting
Graduate degrees offered: M.A. in Accounting; M.B.A., Ph.D. in Business Administration

Professional Program

The professional program in accounting at The University of Iowa is a three-year, upper-division and graduate program that leads to a Master of Arts (M.A.) degree with a major in accounting.

The professional program helps students develop technical proficiency and the conceptual, analytical, and communication skills required in the accounting profession. It is designed to prepare candidates for careers in all areas of accounting; to help prepare candidates for the Certified Public Accountant (CPA) or Certified Management Accountant (CMA) examinations; and to prepare students for demanding leadership roles in the field of accounting. Students who want only an undergraduate-level preparation may meet their goal by completing the first two years of the professional program. The B.B.A. degree is awarded at the end of the first two years of the program and the M.A. is awarded at the end of the third year.

Students may apply for admission to the professional program in accounting after completing two years of preprofessional study that satisfies the general education admission requirements of the College of Business Administration and of the accounting department (see program 1, below). Students who have completed a bachelor's degree with a major field in accounting from another institution (see program 2, below) or a bachelor's degree in a field other than accounting (see program 3, below) also may apply for the M.A. program. Admission information for program 1 is available from the Undergraduate Program Office in the College of Business Administration or from the head of the accounting department. Because of the heavy emphasis on oral and written communication in the M.A. in accounting program, foreign nationals whose primary language is not English and whose TOEFL scores are below 600 are rarely admitted.

Students in the first and second year of the professional program must maintain a 2.00 grade-point average overall and in upper-division accounting courses. Students in the third year of the professional program must maintain a 3.00 grade-point average in all graduate-level accounting courses. Students who do not maintain these minimum grade-point averages are subject to departmental probation and elimination from the professional program in accounting.

As a final condition for completion of the professional program in accounting (three-year program), students must pass an oral examination.

All candidates for the M.A. degree are required to submit a score on the Graduate Management Admission Test (GMAT) as a condition for admission to the third year of the professional program.

All students should consult a current issue of *Suggested Plan of Study,* published by the accounting department each semester, for current information regarding admission procedures, program requirements, electives, and optimal course planning.

Program 1

This program is for students completing their preprofessional program at The University of Iowa. To be eligible for admission, students must apply to both the College of Business Administration and the professional program in accounting.

Undergraduate students at The University of Iowa are eligible for admission to the professional program in accounting once they have:

Completed 60 semester hours of course work, including the six courses required as prerequisites for admission to the College of Business Administration;

Completed 6K:70 Computer Analysis and 6K:71 Statistical Analysis;

and

Earned grades of A or B in 6A:1 Introduction to Financial Accounting and 6A:2 Managerial Cost Accounting, or the equivalent.

Students are designated accounting majors after their applications to the professional program in accounting have been accepted. After successfully completing the first two years of the program, students receive the B.B.A. in accounting.

The first-, second-, and third-year requirements of the professional program are shown below, together with the semester in which they typically are taken.

First Year

Fall Semester

6A:131 Financial Accounting I	3 s.h.
B.B.A. common requirements or electives	12 s.h.

Spring Semester

6A:115 Introduction to Taxation	3 s.h.
6A:132 Financial Accounting II	3 s.h.
6K:176 Managerial Decision Models	3 s.h.
B.B.A. requirements or electives	6 s.h.

Second Year

Fall Semester

6A:130 Cost Accounting for Management Analysis and Control	3 s.h.
6A:144 Auditing	3 s.h.
6E:103 Microeconomics	3 s.h.
B.B.A. requirements or electives	6 s.h.

Spring Semester

6A:145 Financial Accounting III	3 s.h.
6B:165 Business Policy	3 s.h.
6J:148 Law and Business	3 s.h.
B.B.A. requirements or electives	6 s.h.

Third Year

These courses are available upon admission to the third year of the program. At a minimum, students' third-year program must include 15 semester hours of 200-level accounting courses, including 6A:220 and 6A:221, and 15 semester hours of graduate electives.

Fall Semester

6A:220 Accounting Theory I	3 s.h.
6A:222 Accounting Information Systems (or elective)	3 s.h.
6A:230 Auditing and Regulation of Accounting Practice (or elective)	3 s.h.
6A:241 Advanced Tax Accounting for Graduate Students (or elective)	3 s.h.
Electives	6 s.h.

Spring Semester

6A:221 Accounting Theory II	3 s.h.
6A:231 Research in Taxation (or elective)	3 s.h.
6A:233 Controllership (or elective)	3 s.h.
Elective	3 s.h.

Program 2

This program is for students who have earned bachelor's degrees with a major field in accounting at other institutions. To enter the professional program in accounting, these students must submit an application for the M.A. program to the Graduate Admissions Office, 116 Calvin Hall, The University of Iowa. They usually are required to take only the third year of the professional program (program 1, above) to complete the M.A. degree.

Program 3

This program is for students who have bachelor's degrees with no prior training in business or accounting. An individual program is developed for each student at the time of admission.

With careful planning, students can complete the professional program in accounting in two calendar years after being admitted to the Graduate College. Nonbusiness undergraduates planning to enter the program should include as many first-year courses in the undergraduate program as possible. Students entering in the fall semester with no previous accounting or business course work typically take the following courses during their first year.

6A:115 Introduction to Taxation	3 s.h.
6A:131 Financial Accounting I	3 s.h.
6A:132 Financial Accounting II	3 s.h.
6J:148 Law and Business	3 s.h.
6N:190 Consumer and Firm Behavior—M.B.A.	3 s.h.
6N:192 Financial Accounting—M.B.A.	3 s.h.
6N:193 Computer Methods—M.B.A.	1 s.h.
6N:194 Managerial Finance—M.B.A.	3 s.h.
6N:196 Marketing Management—M.B.A.	3 s.h.
6N:197 Quantitative Methods—M.B.A.	3 s.h.
6N:214 Managerial Accounting—M.B.A.	3 s.h.
6N:271 Statistical Methods—M.B.A.	3 s.h.

These are the typical second-year courses:

6A:144 Auditing	3 s.h.
6A:220-221 Accounting Theory I-II	6 s.h.
6A:270 Advanced Financial Accounting Problems	3 s.h.
6N:261 Administrative Science I—M.B.A.	3 s.h.
6N:265 Strategic Management and Business Policy—M.B.A.	3 s.h.
6N:273 Managerial Economic Theory—M.B.A.	3 s.h.
6N:276 Operations Research—M.B.A.	3 s.h.
Graduate accounting electives	6 s.h.

Graduate Program

Doctor of Philosophy

See "Interdepartmental Graduate Programs" in the College of Business Administration introductory section of the *Catalog*.

Courses

Primarily for Undergraduates

6A:000 Cooperative Education Internship **0 s.h.**

6A:1 Introduction to Financial Accounting **3 s.h.**
Survey and analysis of contemporary accounting information systems; emphasis on external reporting by a firm to its investors and creditors. Sophomore or higher standing required.

6A:2 Managerial Cost Accounting **3 s.h.**
Survey and analysis of contemporary accounting information systems; emphasis on preparation of information for management decision making. Prerequisites: 6A:1, 6E:1, and 22M:17.

For Undergraduates and Graduates

6A:113 Taxes and Business Decisions **3 s.h.**
Introduction to important tax concepts; emphasis on recognizing tax-planning opportunities and pitfalls inherent in common management decisions; for nonmajors. Prerequisite: 6A:2 or equivalent.

6A:115 Introduction to Taxation **3 s.h.**
Introduction to federal income taxation; individual, corporate, and partnership income tax laws and regulations; emphasis on developing a broad perspective on the structure, administration, and rationale of the federal income tax system. Admission to professional program in accounting required. Prerequisite: 6A:131.

6A:120 Financial Accounting Reporting **3 s.h.**
Analysis of external accounting reporting practices in the context of decisions by management, current and potential stockholders, financial analysts; emphasis on interpretation and use of financial statements; for students not majoring in accounting who want a better understanding of current accounting reporting practices. Prerequisite: 6A:2 or equivalent.

6A:130 Cost Accounting for Management Analysis and Control **3 s.h.**
Selection and preparation of information that serves to support and assist management in planning and controlling a firm's operations; cost estimation and reporting, cost-volume-profit analysis, budgeting, variance analysis, cost allocation; quantitative techniques integrated with more traditional approaches. Senior standing and admission to professional program in accounting required. Prerequisite: 6K:176.

6A:131 Financial Accounting I **3 s.h.**
Review of income statement and balance sheet accounts, followed by intensive coverage of the asset section of the balance sheet. Junior or higher standing and admission to professional program in accounting required.

6A:132 Financial Accounting II **3 s.h.**
Includes liability and stockholders' equity sections of the balance sheet; cash flow statement; special problems, such as earnings per share, leases, pensions, deferred taxes, and current cost financial statements. Prerequisite: 6A:131.

6A:141 Advanced Tax Topics **3 s.h.**
Taxation of corporations and partnerships from their organization through their liquidation; relative merits of conducting a business through partnership, corporation, proprietorship, and subchapter S corporation. Prerequisite: 6A:115.

6A:144 Auditing **3 s.h.**
Develops an understanding of the audit function as it exists in current business and government operations; audit standards, ethics, and liability; audit evidence, including the application of statistics in sampling and analytical review; audit reports and external influences on audit practice. Senior standing required. Prerequisite: 6A:132. Corequisite: 6A:130.

6A:145 Financial Accounting III **3 s.h.**
Business combinations, reorganizations, and consolidations; recent FASB accounting standards and interpretations; focus on accounting and reporting procedures in governmental and nonprofit organizations. Prerequisite: 6A:132.

6A:170 Special Topics in Accounting **arr.**
Advanced topics in accounting covered in-depth; topics determined by student/faculty interest. Consent of instructor required.

Primarily for Graduates

6A:220 Accounting Theory I **3 s.h.**
Decision theory, capital budgeting, variance investigation, and performance measurement. Offered fall semesters. Prerequisite: 6A:130 or 6N:214.

6A:221 Accounting Theory II **3 s.h.**
Alternative income and asset measurement methods, social choice issues in the selection of alternative accounting methods, implications of efficient capital markets for choice among financial reporting alternatives. Offered spring semesters. Prerequisites: 6A:220, and 6A:145 or 6A:270.

6A:222 Accounting Information Systems **3 s.h.**
Evaluation and design of accounting information systems; emphasis on the acquisition and control of data processing resources and on development of information systems. Offered fall semesters. Prerequisites: 6N:193 and 6N:214. Corequisite: 6A:220.

6A:230 Auditing and Regulation of Accounting Practice **3 s.h.**
Auditing as a control function, government regulation and influence on current financial reporting and audit practice; acquaints students with contemporary problems in auditing and with government agencies that regulate or influence accounting practice. Offered spring semesters. Prerequisites: 6A:144 and 6A:220.

6A:231 Research in Taxation **3 s.h.**
Current tax practices and preparation for continuing research in taxation; emphasis on controversial areas of taxation. Offered fall semesters. Prerequisite: 6A:115.

6A:232 Contemporary Issues in Accounting **3 s.h.**
Specific topics in contemporary accounting issues; content determined by student/faculty interests. Consent of instructor required.

6A:233 Controllership **3 s.h.**
Advanced topics in cost estimation, analysis, allocation, control, and regulation; for students seeking accounting careers in private industry or government. Offered spring semesters. Prerequisite: 6A:220.

6A:240 Financial Accounting Standards and Analysis **3 s.h.**
Accounting model, underlying measurement concepts, and

valuation rules for assets, liabilities, and related issues of income determination; emphasis on economic substance of transactions, evaluation and interpretation of financial data; introduction for nonmajors.

6A:241 Advanced Tax Accounting for Graduate Students **3 s.h.**
A graduate-level introduction to tax research and taxation of business associations (corporations and partnerships). Prerequisite: 6A:115 or equivalent.

6A:245 Financial Information and Capital Markets **3 s.h.**
Use of corporate financial statements for investment and lending decisions; strengths and limitations of corporate accounting data evaluated through research in financial and accounting disciplines.

6A:250 Accounting Issue Series **0 s.h.**
Lecture-workshop sessions with accounting practitioners from industry, government, and public accounting; ideas, practices, and problems these practitioners face; usually six to eight workshops per year. Open only to graduate students.

6A:251 Accounting Issues Series—Honors **3 s.h.**
Lecture-workshop sessions with accounting practitioners from industry, government, and public accounting; ideas, practices, and problems that accountants face. Open only to honors students. Consent of professional program in accounting committee required.

6A:270 Advanced Financial Accounting Problems **3 s.h.**
Advanced financial accounting topics and contemporary problems, such as nonprofit reporting and recent accounting standards; for students who have not completed 6A:145 or do not have a recent accounting degree. Prerequisite: 6A:132.

6A:280 Seminar in Financial Accounting Thought **3 s.h.**
Overview of research methods germane to accounting literature; students develop skills in critical analysis of contemporary accounting research; for doctoral students.

6A:281 Advanced Research Seminar **3 s.h.**
Series of one-semester courses; in-depth coverage of research literature: economics of accounting choice, capital markets research, audit policy and methods, behavioral accounting, principal-agent/analytical modeling, experimental economics research in accounting and auditing; series of one-semester courses for doctoral students.

6A:286 Seminar in Accounting Research **arr.**
Student-faculty forum for discussion of current research topics in accounting and related disciplines; papers written by faculty, students, and invited guests provide basis for exchange of ideas and criticisms; Ph.D. dissertation proposals in accounting are presented; for doctoral students.

6A:287 Seminar in Selected Accounting Topics **arr.**
Individually guided study and research paper preparation in specialized topic areas. Consent of instructor required.

6A:290 Thesis: Accounting **arr.**
Consent of instructor required.

ECONOMICS

Chair: George R. Neumann
Professors: William Albrecht, George Daly, Andrew Daughety, Benjamin Eden, Gary Fethke, Robert Forsythe, John Fuller, Joel Horowitz, Hyman Joseph, John Kennan, Donald McCloskey, Forrest Nelson, George Neumann, Gerald Nordquist, Thomas Pogue, Jennifer Reinganum, N.E. Savin, Larry Sgontz, Calvin Siebert, S.Y. Wu
Professor emeritus: Anthony Costantino
Associate professors: Michael Balch, Raymond Riezman, John Solow, Charles Whiteman
Assistant professors: Andreas Blume, Satyajit Chatterjee, Dean Corbae, Beth Ingram, Yong-Gwan Kim, Naryana Kocherlakota, Barbara McCutcheon, Robert Tamura
Adjunct professor: J. Richard Zecher
Undergraduate degrees offered: B.A., B.S., B.B.A. in Economics
Graduate degrees offered: M.A., Ph.D. in Economics

Economics is concerned primarily with analysis and description of the production, distribution, and consumption of goods and services in society. It involves the systematic study of topics such as wealth and poverty, money and banking, income and consumption, government expenditures and taxation, prosperity and depression, inflation and unemployment, big business and labor unions, and hundreds of other matters that intimately affect the way people live.

The purpose of studying economics is to develop an understanding of how complex economic systems work and to acquire training in the methods of economic analysis, which can be applied to a wide range of economic problems. The department offers courses to meet the needs of the nonmajor as well as the major.

Undergraduate Programs

The baccalaureate programs in economics provide an excellent educational background for a variety of positions in business and government. Graduates find employment in banking, financial institutions, industrial firms, and trade organizations, and in federal, state, and local government agencies dealing with economic policy, regulation, and analysis. Economics also is regarded as excellent preparation for law and for graduate study in fields such as business management, public administration, health and hospital administration, urban and regional planning, transportation, journalism, political science, and statistics.

The department offers three undergraduate degrees in economics—the B.A. and B.S. degrees in the College of Liberal Arts and the B.B.A. in the College of Business Administration.

The B.A. and B.S. programs are designed for a well-rounded liberal arts education. Requirements for the B.B.A. degree emphasize instruction in the business fields of accounting, finance, marketing, business law, and management.

For descriptions of the B.A. and B.S. degree programs in economics, see "Economics" in the College of Liberal Arts section of the *Catalog*.

Bachelor of Business Administration

In addition to the common requirements of the College of Business Administration, the B.B.A. degree in economics requires 18 semester hours in 100-level economics courses, including:

6E:103 Microeconomics
6E:105 Macroeconomics

Graduate Programs

Master of Arts

The Master of Arts is offered only to students working toward a Ph.D. degree or to those who earn a joint M.A. with geography or a joint M.A.-J.D. with law.

Joint M.A. Programs

The department collaborates with the Department of Geography in a joint M.A. degree and with the College of Law in a joint M.A.-J.D. degree. In these programs the economics department accepts up to 9 semester hours of course work from the other departments as credit toward the M.A. degree in economics, and the other departments accept graduate credits in economics toward their degrees.

Doctor of Philosophy

The Ph.D. program is designed to provide rigorous training in microeconomic theory, macroeconomic theory, mathematical economics, and econometrics. In addition, students select a major area for intensive study and specialization. The program has three components: a coordinated sequence of core courses, a set of major area courses, and a dissertation.

Core Sequence

First Semester

6E:180 Mathematics for Economists I
6E:203 Microeconomics I
6E:204 Macroeconomics I

Second Semester

6E:181 Mathematics for Economists II
6E:205 Microeconomics II
6E:206 Macroeconomics II

Third Semester

6E:211 Mathematical Economics I
6E:221 Econometrics

Fourth Semester

6E:222 Applied Econometrics

An additional 3 semester hours in economic history, history of economic thought, or economic methodology are required. Written examinations in microeconomics and macroeconomics before the second year and a substantial research paper before the beginning of the third year complete the core requirements.

Field Component

Each student chooses a major area of study in addition to the core courses. The requirement for the major area is a minimum of 24 semester hours of intensive study in a field and in courses that enable students to understand the relationship between their specialty and related fields. Students must achieve at least a 3.20 grade-point average in the major area courses.

Dissertation

Students must present and defend a dissertation prospectus during their third year. Admission to candidacy is granted upon successful defense of the prospectus. Submission of the completed dissertation and an oral defense of the dissertation research completes the Ph.D. program.

Courses

Primarily for Undergraduates

Note: 6E:1 and 6E:2 may be taken in either order or simultaneously.

6E:000 Cooperative Education Internship 0 s.h.

6E:1 Principles of Microeconomics 3-4 s.h.
Organization and workings of modern economic systems; role of markets, prices, and competition in the promotion of economic welfare; alternative systems; international trade. GER: social sciences (except B.B.A. students). Prerequisite: satisfaction of University rhetoric requirement or 12 s.h. of other UI course work.

6E:2 Principles of Macroeconomics 3-4 s.h.
National income and output, employment and prices; money and credit; government finance; monetary and fiscal policy; economic growth and development; international finance. GER: social sciences (except B.B.A. students). Prerequisite: satisfaction of University rhetoric requirement or 12 s.h. of other UI course work.

6E:7 Contemporary Economic Problems and Policy 2-3 s.h.

6E:85 Economic Statistics 3 s.h.
Application of statistical methods to problems in economics; topics include regression analysis, contingency tables and goodness of fit tests, simple time series modeling, presentation of economic statistics, index number construction, and survey and census methods. Prerequisites: 6E:1, 6E:2, and 22S:8 or 22S:25.

6E:99 Internship arr.
Open only to students participating in the Washington Center for Learning Alternatives or other approved internship programs. Offered only satisfactory-fail. Consent of instructor required.

6E:100 Price Employment and Production Theory 3-4 s.h.

6E:103 Microeconomics 3 s.h.
Economic theory of consumer behavior, producer behavior, and role of markets in coordinating economic decisions; conditions for efficient resource allocation by the market mechanism. Prerequisites: grade of C or higher in 6E:1 and 6E:2, or consent of undergraduate director.

6E:105 Macroeconomics 3 s.h.
Measurement of national product, unemployment, and inflation; determination of national income and the price level; analysis of the use of stabilization policies; explanation of the dynamics of inflation and the problem of stagflation. Prerequisites: grade of C of higher in 6E:1 and 6E:2, or consent of undergraduate director.

6E:111 Labor Economics 3 s.h.
Microeconomic analysis of labor markets and related institutions; labor supply decisions made by workers, labor demand decisions made by firms, and resulting patterns of employment and wages; economic analysis of unions; causes of unemployment. Prerequisite: 6E:1 or consent of instructor.

6E:113 Health Economics 3 s.h.
Structure of America's medical care industry and applications of economic analysis to its problems of production, pricing, and distribution; impact of insurance and the role of private and governmental planning agencies. Prerequisites: 6E:1 and 6E:2, or consent of instructor.

6E:117 Money and Banking 3 s.h.
Monetary institutions; theory, practice, and policy with respect to the role of money in the determination of income, employment, and prices in domestic and world economy. Prerequisites: 6E:1 and 6E:2, or senior standing.

6E:119 Economics of the Government Sector 3 s.h.
Economic functions of government in modern economies; economic decision making in government; budgetary processes; effects of government expenditures and taxation on allocation of resources, distribution of income, economic growth, and stability. Prerequisites: 6E:1 and 6E:2, or consent of instructor.

6E:123 Political Economy of the Military-Industrial Complex 3 s.h.
Examines recent literature on the theory of the "military-industrial complex," contrasts these views with those of the classical school on national security affairs; traces historical development of the "complex," attempts to relate it to causes and consequences in political, economic, and social dimensions. Prerequisites: 6E:1 and 6E:2, or senior standing.

6E:125 International Economics 3 s.h.
Foreign exchange and balance of payments; international monetary arrangements and policy; theory of international trade; role of tariffs and restrictions in international trade. Prerequisites: 6E:1 and 6E:2, or senior standing.

6E:127 Natural Resources in the World Economy: Control and Conflict 2-3 s.h.
Economic issues connected with the "new scarcity" in natural resources; theory of natural resources production; natural resources and economic growth; common property resources; market structure and strategy; supply and demand outlook; role of technological advancement, actual and potential conflict among nations; policy issues. Prerequisites: 6E:1 and 6E:2, or senior standing.

6E:129 Economic Development: Underdeveloped Areas 3 s.h.
The problem of underdevelopment in Third World countries; examination of theories and policies of economic development. Prerequisites: 6E:1 and 6E:2, or senior standing.

6E:131 Agricultural and Food Policy 3 s.h.
Examination of major elements in the farm policy debate and agricultural policy formulation; analysis of agricultural production, markets and market structure, government commodity programs, farm income and regional farm structure, world food policy, and domestic agricultural policy. Prerequisites: 6E:1 and 6E:2, or senior standing.

6E:133 Environmental Economics 3 s.h.
Economic analysis of current environmental and resource use problems; policies for environmental protection. Prerequisites: 6E:1 and 6E:2, or senior standing, or consent of instructor.

6E:135 Regional and Urban Economics 3 s.h.
Theory of location and regional development; factors influencing location of production, city location and hierarchies, land-use patterns, and measurement and change in regional economic activity; public policy issues in regional and urban development. Prerequisites: 6E:1 and 6E:2, or senior standing.

6E:141 Economics of American Industries 3 s.h.
Structural evolution of American industries, imperfect competition and resource allocation; development of public policies toward monopoly practices; studies of selected industries. Prerequisites: 6E:1 and 6E:2, or senior standing.

6E:145 Introduction to Transportation 3 s.h.
Same as 102:133, 44:133.

6E:150 Introduction to Economic History 3 s.h.
Western economic development from antiquity to the present, with equal emphasis on the centuries before and after A.D. 1700; topics include the evolution of population, technology, business organization, production, and trade; the dynamics of economic systems; methodology. Prerequisite: 6E:1 or equivalent.

6E:151 American Economic History 3 s.h.
Analysis based on theoretical model of how the American economy has developed; special emphasis on demographic factors, role of government, capital markets, structural change. Prerequisites: 6E:1 and 6E:2, or senior standing. Same as 16A:144.

6E:152 British Economic History 3 s.h.
Topics in eight centuries of British history from economic viewpoint; open fields, enclosures, the Industrial Revolution, industrial decline. Prerequisite: 6E:1 or 6E:2 or equivalent.

6E:161 History of Economic Thought 2-3 s.h.

6E:164 The Soviet Economy 3 s.h.
Organization and operation of the Soviet-type economy, including historical and ideological influences; detailed study of central planning, industrial management, labor, agriculture, technology, trade, and living conditions in the USSR; critique of Soviet economic performance, Soviet economic reforms compared to reforms in other socialist countries; prospects for increased integration in the world economy. Prerequisites: 6E:1 and 6E:2, or senior standing.

6E:165 Modern Economies of East Asia 3 s.h.
Industrial and rapidly industrializing economies in East Asia (Japan, South Korea, Taiwan, Hong Kong, Singapore, and the Peoples' Republic of China); comparative resource endowments, economic systems, and economic policies; patterns of investment and technological change; labor-management relations and living conditions; international economic relations; current problems and future prospects. Prerequisites: 6E:1 and 6E:2, or senior standing.

6E:166 The Political Economy of Socialism 3 s.h.
Evolution of socialist economic thought; contemporary models of socialist economy; existing socialist systems (USSR, Eastern Europe, China, Cuba); recent reforms and contrasts with welfare capitalism. Prerequisites: 6E:1 and 6E:2, or senior standing.

6E:169 Problems of the World Monetary Order 3 s.h.
Balance of payments, foreign exchange, and capital markets; evaluation of the world monetary system from Bretton Woods to the present; major global monetary problems. Not open to economics majors or minors. Open only to juniors and seniors.

6E:171 Antitrust: Legal and Economic Analysis 3 s.h.
Current federal antitrust policy; topics include federal merger policy, monopolization, predatory pricing, collusion, vertical restrictions and resale price maintenance, and enforcement; reading from case law as well as economics literature. Prerequisite: 91:208 or 6E:103 or consent of instructor. Same as 91:201.

6E:172 Law and Economics 3 s.h.
Introduction to the field of law and economics; law examined through analytic tools of microeconomics; impact of legal rules on resource allocation, risk bearing, and distribution of economic well-being. Prerequisite: 6E:103, or consent of instructor. Same as 91:295.

6E:173 Advanced International Economics 3 s.h.
Neoclassical model of international trade, theory of comparative advantage, role of trade barriers, balance of payments, foreign exchange, macroeconomic policy in an open economy. Prerequisites: 6E:103 and 6E:105; or graduate standing.

6E:174 Monetary Economics 3 s.h.
Demand for and supply of money; role of money in the economy; empirical studies of the impact of money; problems with monetary control. Prerequisite: 6E:105 or 6E:117 or equivalent or consent of instructor.

6E:175 Economic Analysis of Labor Markets 3 s.h.
Nontechnical introduction to topics that labor economists currently are studying: the nature and causes of unemployment; long-term employment arrangements; economic analysis of unions, bargaining, arbitration, and strikes. Prerequisites: 6E:103 and elementary calculus and statistics.

6E:177 Industrial Organization 3 s.h.
Survey of market structure in the United States; public policy issues in industrial organization; theories of imperfect competition; appraisal of antitrust policies and government regulation of business. Prerequisite: 6E:103.

6E:180 Mathematics for Economists I 3 s.h.
Matrix algebra, determinants, linear systems of equations; review of single-variable differential calculus, calculus for functions of several variables; Lagrangian and second order conditions for the maximization problem with single equation constraint. Offered fall semesters. Prerequisite: one year of calculus or consent of instructor.

6E:181 Mathematics for Economists II 3 s.h.
Introduction to set theory, equivalence and order relations; introductory linear algebra and real analysis; metric and topological spaces; applications drawn from economics. Offered spring semesters. Prerequisite: 6E:180, or one year of calculus and matrix algebra.

6E:184 Introduction to Econometrics 3 s.h.
Single equation linear statistical models, estimation and hypothesis testing; serial correlation, heteroscedasticity, and generalized least squares estimation; specification analysis; errors in variables; introduction to simultaneous equation models; emphasis on interpretation and application of econometric models and methods. Prerequisite: 22S:120 or equivalent.

6E:185 Introduction to Applied Econometrics 3 s.h.
Substantive problems from economics, business, and social sciences examined in detail to illustrate methods and issues in modeling, data collection, and inference; simple and multiple linear regression, time series, logistic regression, systems of equations, nonlinear regression; extensive use of computers. Prerequisite: 6E:184 or equivalent.

For Advanced Undergraduates

6E:197 Honors Seminar arr.
Consent of instructor required.

6E:198 Senior Thesis in Economics arr.
Primarily for honors students. Consent of instructor required.

6E:199 Readings and Independent Study in Economics arr.
Consent of instructor required.

M.B.A. Courses

Primarily for Graduates

With consent of the department chair, qualified undergraduate students may enroll in courses listed for graduate students.

6E:202 Price Theory 3 s.h.
Theory of consumer, theory of firm; theory of markets; general equilibrium and welfare economics.

6E:203 Microeconomics I 3 s.h.
Price theory; strong emphasis on formulation and solving of problems, development of basic economic intuition; producer and consumer behavior, theory of competitive and noncompetitive markets, and welfare economics. Offered fall semesters. Consent of instructor required.

6E:204 Macroeconomics I 3 s.h.
Aggregate economics statistics; comparative static analysis of neoclassical, neo-Keynesian, and monetarist macroeconomic models; sectoral demands, dynamics of inflationary expectations and employment; economic growth. Offered fall semesters. Consent of instructor required.

6E:205 Microeconomics II 3 s.h.
Calculus treatment of the neoclassical paradigm; the nature of its axioms and its essential conclusions; limitations of the paradigm and some orientation to alternative theories. Offered spring semesters. Prerequisite: 6E:203 or 6E:180 or one year of calculus.

6E:206 Macroeconomics II 3 s.h.
Further analysis of comparative static and dynamic macroeconomic models; stochastic macroeconomics; role of stabilization policies; equilibrium business cycle theory. Offered spring semesters. Prerequisite: 6E:204 or consent of instructor.

6E:211 Mathematical Economics I 3 s.h.
Introduction to convex analysis in economic theory; ordinal and cardinal preference relations; quasiconcave and concave numerical representations; separation principle for convex sets: linear programming; concave programming; Brouwer fixed point theorem and existence of competitive equilibrium. Offered fall semesters. Prerequisites: 6E:205 and 6E:181.

6E:212 Mathematical Economics II 3 s.h.
Theories of n-person games, noncooperative or cooperative, with applications to general economic equilibrium analysis. Prerequisite: 6E:211.

6E:217 The Economics of Uncertainty 2-6 s.h.
The nature of information and informational equilibrium; topics in risk and risk aversion; temporal resolution of uncertainty. Prerequisite: 6E:211.

6E:221 Econometrics 3 s.h.
Statistical inference in single and multiple equation stochastic models, models with nonindependent or nonidentically distributed error structure, and dynamic models; OLS, GLS, IV, and ML estimation; introduction to asymptotic distribution theory; exact and asymptotic hypothesis tests. Prerequisite: 22S:154 or equivalent.

6E:222 Applied Econometrics 3 s.h.
Empirical problems drawn from substantive areas in economics demonstrate application of econometric techniques; models and methods include multiple linear regression, nonlinear regression, maximum likelihood, hazard functions, univariate and multivariate time series, and flexible functional forms. Prerequisite: 6E:221.

6E:223 Econometric Theory I 3 s.h.
Rigorous treatment of statistical theory underlying econometric inference; emphasis on estimation and hypothesis testing in linear models. Prerequisite: 6E:221.

6E:224 Econometric Theory II 3 s.h.
Continuation of 6E:223; emphasis on estimation and hypothesis testing in nonlinear models. Prerequisite: 6E:223.

6E:225 Topics in Econometrics 3 s.h.
Advanced econometric theory and methods; topic varies with interests of students and instructor. Prerequisite: 6E:224 or consent of instructor.

6E:226 Travel Demand Modeling 3 s.h.
Mathematical and statistical background for travel demand modeling; choice theories; random utility models; econometric methods for the multinomial logit and related models; applications of random utility models to travel demand forecasting; demand/performance equilibration. Prerequisite: 6E:184 or 6E:221. Same as 44:236.

6E:231 Economic Development and Policy Alternatives 3 s.h.
Process of economic development with emphasis on theories of development and policy alternatives. Consent of instructor required.

6E:234 Development Policy and Planning in the Third World 3 s.h.
Cross-cultural and interdisciplinary analysis of problems associated with urbanization and development in the developing nations. Same as 113:275, 44:275, 34:275, 102:275, 42:275, 7F:275.

6E:235 International Trade Theory 3 s.h.
Theory of foreign trade; tariff theory and policy; other selected topics. Consent of instructor required.

6E:236 International Monetary Economics 3 s.h.
Theory of foreign exchange; balance of payments adjustment; exchange controls; international investment; macropolicy in an open economy. Consent of instructor required.

6E:241 Macroeconomics III 2-6 s.h.
Organized survey of current research in macroeconomics; designed to help advanced students identify and develop their own topics for research, emphasizing both theoretical and empirical analysis. Prerequisites: 6E:205 and 6E:221.

6E:245 Monetary Theory 2-3 s.h.
Optimum quantity of money; models of monetary growth; overlapping generation models with applications to monetary economies; determinants of interest rates; effects of anticipated and unanticipated money supply changes; empirical estimates of the impact of money. Consent of instructor required.

6E:250 Labor Economics 3 s.h.
Introduction to basic problems and models in labor economics, including intertemporal models of labor markets; uncertainty and labor market activity; retirement decisions, economic theories of fertility; economics of discrimination; models of job search; economic models of unions; bargaining and strikes, public sector labor markets; determinants of the distribution of income; emphasis on empirical verification of theory. Prerequisites: 6E:205, and 6E:221 or 6E:184.

6E:251 Labor Economics 3 s.h.
Detailed review of selected current research topics, with emphasis on prospects for original research; may include life cycle models of labor supply, dynamic labor demand models, compensating wage differentials, labor turnover, cyclical employment fluctuations, aspects of collective bargaining. Prerequisites: 6E:205, and 6E:221 or 6E:184.

6E:263 European Economic History 3 s.h.
European economic growth since the Industrial Revolution; emphasis on population trends and labor force growth, evolution of capital markets, patterns of capital accumulation, resultant rates of economic growth; analyses of technological progress and growth of open economies. Consent of instructor required.

6E:265 History, Thought, and Methodology 2-6 s.h.
Course is divided into three modules: economic modeling in a historic context and topics in economic history; development of economic theory from the classical school to the present; and premises of different methods of modeling economic behavior. Consent of instructor required.

6E:268 History of Economic Thought II 3 s.h.
Development of marginalist, neoclassical, and Keynesian thought; American economic thought including institutional economics; varieties of socialist economies; ultraliberal tradition. Consent of instructor required.

6E:271 Industrial Organization 2-4 s.h.
Theories of the firm, monopolistic competition, oligopoly and workable competition; industrial organization and nature of equilibrium under uncertainty. Prerequisites: 6E:205 and 6E:211.

6E:272 Economics of Organization 2-4 s.h.
Design of industrial organization and incentive mechanisms in achieving efficient allocations; studies of not-for-profit activities and their welfare implications. Prerequisite: 6E:205.

6E:281 Economics of the Government Sector: Taxation 3 s.h.
Role and effects of taxation; effects of major taxes on allocation of resources, distribution of income, and economic growth and stability; debt finance as an alternative to tax finance.

6E:282 Economics of the Government Sector: Expenditures 3 s.h.
Economic functions and effects of government spending; budgetary processes; benefit-cost analysis; theories of bureaucracy; voting models; centralized versus decentralized decision making; intergovernmental fiscal relations.

6E:290 Regional Development: Theory and Policy 3 s.h.
Models of regional growth and development, urbanization and city-size distributions in growth and development, development pole theory, regional equilibrium and disequilibrium analysis, regional economic policy for development. Prerequisite: 6E:203 or consent of instructor. Same as 44:290, 102:290.

6E:293 Advanced Location Theory 3 s.h.
Economics of location; location of the firm; transportation cost and location; location-allocation models; spatial price theory. Prerequisite: 6E:202 or 6E:203 or consent of instructor. Same as 44:293.

6E:300 Readings in Economics arr.
Consent of instructor required.

6E:301 Thesis in Economics arr.
Consent of instructor required.

6E:302 Dissertation Seminar 1-3 s.h.
Approval of prospectus required.

6E:305 Economics Seminar arr.

6E:323 Workshop in Applied Econometrics and Statistics arr.

Advanced Graduate Seminars

6E:309 Readings in Advanced Economic Theory 3 s.h.
Unstructured course; seven to ten recent papers, published or unpublished, are selected; discussion of content and subjects related to each paper. Prerequisites: 6E:203 and 6E:205.

6E:310 Seminar in Economic Theory arr.
Consent of instructor required.

6E:311 Seminar in Microeconomics arr.
Consent of instructor required.

6E:312 Seminar in Macro and Monetary Economics arr.
Consent of instructor required.

6E:313 Seminar in Econometrics arr.
Consent of instructor required.

6E:321 Workshop in Microeconomics arr.
Consent of instructor required.

6E:322 Workshop in Macro and Monetary Economics arr.
Consent of instructor required.

FINANCE

Chair: Carl Schweser
Professors: Susan Phillips, Marc Reinganum (Phillips Professor), Richard A. Stevenson, Emmett J. Vaughan (Partington Professor)
Professors emeriti: Clifford M. Baumback, Walter Krause, Charles E. Marberry, Robert M. Soldofsky
Associate professors: Jarjisu Sa-Aadu, Carl Schweser, Gerry Suchanek, Paul Weller
Assistant professors: Utpal Bhattacharya, Paul Fellows, Stephen Mahle, Ken Martin, Sarah Peck, Rajiv Sant
Assistant professor emeritus: Ernest V. Zuber
Undergraduate degree offered: B.B.A. in Finance
Graduate degrees offered: M.B.A.; M.A., Ph.D. in Business Administration

Undergraduate Program

The undergraduate finance program deals with the theory, organization, and operations of the financial system from both social and managerial viewpoints. Students are expected to develop analytical abilities and to present their analyses in both written and oral form.

Students graduating with a major in finance may look forward to managerial positions in controllership or treasury work in nonfinancial businesses, in the entire range of financial businesses, or in nonprofit or government organizations. The education received is consistent with progress toward responsible managerial positions.

Requirements for the Bachelor of Business Administration degree with a finance major are as follows:

6F:111 Investments
6F:117 Intermediate Financial Management

At least three semester hours of accounting beyond the basic core, followed by any three of these:

6F:112 Security Analysis
6F:113 Financial Markets and Institutions
6F:114 Commercial Banking
6F:116 Futures Trading
6F:124 Risk Management
6F:126 Real Estate and Urban Land Economics
6F:130 International Finance

Graduate Program

See "Interdepartmental Graduate Programs" in the College of Business Administration introductory section of the *Catalog*.

Courses

Primarily for Upper-Division Undergraduates

6F:000 Cooperative Education Internship 0 s.h.

6F:100 Introductory Financial Management 3 s.h.
Financial planning and management of money and capital in business firms; security markets. Prerequisites: 6A:2, 6E:1, 6E:2, and junior standing.

6F:101 Directed Readings in Finance arr.
Individually guided readings in selected topics in business.

6F:102 General Insurance 3 s.h.
Theory of risk and risk bearing; arrangements for dealing with risk; insurance industry; types of insurers, functions of insurers, and government regulation of insurance; social insurance; basic features of selected insurance contracts. Prerequisites: 6E:1 and 6E:2.

6F:111 Investments 3 s.h.
Activities involved in choosing alternative financial assets from an individual's viewpoint; present value; security markets; industry developments. Prerequisite: 6F:100 or consent of instructor.

6F:112 Security Analysis 3 s.h.
Valuation of corporate securities; financial statement analysis; economic and regulatory environment. Prerequisite: 6F:111 or consent of instructor.

6F:113 Financial Markets and Institutions 3 s.h.
The role of money and capital markets in the processes of change and development; flow of funds, institutions, instruments, pricing in financial markets. Prerequisite: 6F:100 or consent of instructor.

6F:114 Commercial Banking 3 s.h.
Management of commercial banks and other financial institutions; emphasis on tools and concepts of running a bank, assets and liabilities; may use case studies. Prerequisite: 6F:100 or consent of instructor.

6F:116 Futures Trading 2-3 s.h.
Historical development of futures trading, trading practices and procedures, hedging, and regulatory aspects. Prerequisite: 6F:111 or consent of instructor.

6F:117 Intermediate Financial Management 3 s.h.
Analysis of financial decisions made by financial managers (e.g., capital structure, dividend policy, lease-or-buy, mergers, and issuance of new securities). Prerequisite: 6F:100 or consent of instructor.

6F:121 Property and Liability Insurance 3 s.h.
Business and individual needs for insurance, fire insurance, marine insurance, and allied lines; public liability, automobile, other property and casualty coverages; insurance contracts and underwriting. Prerequisite: 6F:102.

6F:122 Life and Health Insurance 3 s.h.
Life, health, and annuity contracts from the viewpoints of the individual, business, government, and insurance companies; policy types, rate making, investments, regulation, group insurance, estate planning. Prerequisite: 6F:102.

6F:124 Risk Management 3 s.h.
Nonspeculative risks in business and selected management devices for dealing with them; avoidance, assumption, reduction, and transfer of risk; risk management decisions; control of risk and reduction of losses; case studies in risk management. Prerequisites: 6F:121 and 6F:122, or consent of instructor.

6F:126 Real Estate and Urban Land Economics 3 s.h.
Physical, legal, and economic fundamentals of real estate; analysis of local economies and real estate markets; mortgage financing, appraisal principles, investment analysis, and land development. Prerequisite: 6F:100 or consent of instructor.

6F:127 Entrepreneurship and New Business Formation 3 s.h.
Characteristics of the successful entrepreneur and of making the decision to go into business for oneself; development of a procedural system for establishing a new business.

6F:128 Managing the New or Small Business 3 s.h.
Role of small business in the economy; management of the ongoing small business; problems confronting the entrepreneur in the small enterprise.

6F:130 International Finance 3 s.h.
Multinational business, international monetary system, bases for world trade, development of less-developed countries, foreign investment; emphasis on distinctions between international and domestic business operations. Prerequisite: 6F:100 or consent of instructor.

6F:141 Real Estate Appraising 3 s.h.
Theory and practice of valuing real property. Prerequisite: 6F:126.

Primarily for Graduates

6F:201 Directed Readings in Finance arr.
Individually guided readings in selected finance topics.

6F:202 M.A. Research Report 1 s.h.
Major paper. Open only to nonthesis M.A. candidates. Consent of instructor required.

6F:205 Contemporary Topics in Finance arr.

6F:212 Investment Management 3 s.h.
Types of securities available for investment; analysis of financial statements and evaluation of securities; methods of managing an investment portfolio. Prerequisite: 6N:194.

6F:213 Options 3 s.h.
Analysis of theory of options pricing and futures markets; application of options techniques to valuing corporate debt; hedging and management of financial risk. Prerequisite: 6N:194.

6F:214 Real Estate Investment Management 3 s.h.
Application of analytical techniques to problems of structuring real estate investment; feasibility analysis, constraints of federal tax law, sources and methods of financing, property risk characteristics, and alternative ownership forms. Prerequisite: 6N:194 or 6F:126 or consent of instructor.

6F:215 Financial Policy Decisions—M.B.A. 3 s.h.
Problems approach to policy, structured problems and cases; decision models; current and fixed asset administration, raising funds, cost of funds, capital budgeting, dividends, mergers. Prerequisite: 6N:194 or equivalent.

6F:216 Financial Markets and Fixed Income Securities 3 s.h.
Behavior of asset returns; term structure of interest rates; market efficiency; asset pricing models and theories of fixed income securities; valuation of contingent claims. Prerequisite: 6N:194 or consent of instructor.

6F:217 Portfolio Theory and Planning 3 s.h.
Modern theoretical concepts relating to management of portfolios of financial institutions, including portfolio models, performance measurement, risk, and portfolio construction. Prerequisites: 6F:212, and 6N:271 or consent of instructor.

6F:218 Seminar in Finance arr.
Consent of instructor required.

6F:220 Management of Financial Institutions 3 s.h.
Predominantly case-study approach to analysis of problems and operations of various major U.S. financial institutions including commercial banks, insurance companies, savings and loan associations, mutual savings banks, and credit unions; industry and regulatory considerations. Prerequisite: 6N:194 or consent of instructor.

6F:223 Risk and Uncertainty 3 s.h.
Selected theoretical aspects of risk; economic and mathematical aspects; current problems in risk theory.

6F:224 Risk Management in Business 3 s.h.
Nonspeculative risks in business and selected management devices for dealing with them; assumption, avoidance, transfer, and reduction of risk; risk management decisions; control of risk and reduction of losses; case studies in risk management.

6F:226 Advanced Corporate Finance 3 s.h.
Principles of valuation (DCF and CAPM), valuation under certainty and uncertainty, financial structure and the cost of capital, dividend policy, firm investment in perfect and imperfect capital markets, options pricing theory, state preference model; for Ph.D. and advanced master's degree candidates.

6F:227 Advanced Finance Theory 3 s.h.
Options valuation; financial leverage, market efficiency and information economics, term structure models, capital market equilibrium models, corporate finance issues; emphasis on theory; for Ph.D. students.

6F:228 Advanced Empirical Finance 3 s.h.
Market efficiency tests; term structure theory tests; tests of asset pricing models; tests of dividend policy and financial structure issues; for Ph.D. students.

6F:230 International Finance 3 s.h.
Special problems related to operation of business in a foreign environment discussed in the framework of financial decision making. Prerequisite: 6N:194.

6F:270 Research in Finance **arr.**
Individually guided research projects on topics in finance. Consent of instructor required.

6F:290 Thesis in Business **arr.**
Consent of instructor required.

MANAGEMENT AND ORGANIZATIONS

Chair: Edward J. Conlon
Professors: Edward J. Conlon, John Kennan, Charles R. Klasson, Lola L. Lopes (Pomerantz Professor), George Neumann, Gerald L. Rose, Sara L. Rynes, Frank Schmidt (Sheets Professor), Peter Schoderbek, Anthony V. Sinicropi (Murray Professor), Duane E. Thompson
Associate professors: Jay Christensen-Szalanski, John T. Delaney, Jack T. Fiorito, Thomas P. Gilroy, Nancy R. Hauserman, Michael K. Mount, Jude P. West
Assistant professors: Maureen Ambrose, Murray Barrick, Paul Jarley, Susan Schwochau
Undergraduate degree offered: B.B.A. in Industrial Relations and Human Resources
Graduate degrees offered: M.B.A.; M.A., Ph.D. in Business Administration

Students majoring in industrial relations and human resources take courses of study that deal with administrative processes, labor relations, human resources management, organizational design, and strategic management. The program is designed to give students a thorough background in these areas as well as an understanding of their application to real-life situations. Specific courses, research projects, and other experiences, such as simulations, are blended to include both theoretical and pragmatic aspects of the field.

The Management and Organizations Department offers two tracks of study. The administrative studies track provides students with training in individual and group behavior, organizational design, and organizational strategy. It prepares students for administrative and consulting positions in both public and private sector organizations. Graduates are prepared for positions in general management and organizational consulting.

The industrial relations and human resources track prepares students for a variety of line, staff, and professional positions in business, government, nonprofit institutions, and education. Work areas for which graduates are qualified include personnel management, wage and salary administration, staff benefits, selection and recruitment, performance appraisal, industrial training, manpower issues, collective bargaining, contract administration, grievance handling, dispute resolution, and labor legislation areas, such as equal employment opportunity, social insurance, equal pay, age discrimination, and labor relations law.

Undergraduate Program

Requirements for the Bachelor of Business Administration degree with a major in industrial relations and human resources are as follows:

Industrial Relations and Human Resources Track

6J:150 Protective Labor Legislation	3 s.h.
6J:153 Collective Bargaining	3 s.h.
6J:158 Personnel Management	3 s.h.
Specialized area (industrial relations and/or human resources management)	6 s.h.
Total	15 s.h.

Students select courses in the specialized area based on their individual interests, with the advice and consent of their advisers.

Administrative Studies Track

6J:161 Individual Behavior in Organizations	3 s.h.
6J:162 Group Behavior in Organizations	3 s.h.
6J:163 Organizational Design and Operations	3 s.h.
6K:176 Managerial Decision Models	3 s.h.
6K:180 Management Information Systems	3 s.h.
6J:183 Managerial Information Processing and Decision Behavior	3 s.h.
One of these:	
6E:103 Microeconomics	3 s.h.
6J:169 Selected Problems in Administrative Science	3 s.h.
6K:184 Production Planning and Control	3 s.h.
Total	21 s.h.

Graduate Programs

Master of Arts

A Master of Arts degree with a major in industrial relations and human resources is available as a special nonthesis program for students who seek a professional degree in the field. The degree provides concentrated graduate study in labor relations and personnel management. Students complete 35-41 semester hours of course work selected with consent of an adviser. The 35-41 semester hours include the common body of business knowledge requirements mandated by the American Assembly of Collegiate Schools of Business. For general requirements see "Interdepartmental Graduate Programs" in the College of Business Administration introductory section of the *Catalog*.

Doctor of Philosophy

Students seeking a Ph.D. in industrial relations and human resources will find degree requirements specified under "Interdepartmental Graduate Programs" in the College of Business Administration introductory section of the *Catalog*.

Courses

Primarily for Upper-Division Undergraduates

6J:000 Internship in Management and Organizations **0 s.h.**

6J:47 Introduction to Law **3 s.h.**
General history and structure of law; law's action in guiding changing economic and social patterns. Prerequisites: 6E:1 and 6E:2, or junior standing.

6J:100 Administrative Management **3 s.h.**
Basic treatment of principles of management, organizational structure, decision making, leadership line staff relationships, and administration of organizations. Prerequisites: 6E:1, 6E:2, and junior standing.

6J:101 Directed Readings in Industrial Relations and Human Resources Management **arr.**
Individually guided readings in selected topics. Consent of instructor required.

6J:146 International Business Environment **3 s.h.**
Focus on discerning what makes international business different from domestic business, especially the cultural, legal, and political factors to which managers must adapt. Junior or higher standing required.

6J:148 Law and Business **3 s.h.**
Contract, agency, and other operative areas of law applied in business; primarily for accounting majors. Junior or higher standing required. Prerequisite: 6J:47.

6J:150 Protective Labor Legislation **3 s.h.**
Comprehensive study of laws regulating safety and health in business and industry; employment discrimination, unemployment and retirement benefits, other work-related statutes. Prerequisite: 6J:47.

6J:152 Labor Relations Legislation **3 s.h.**
History of labor regulation and current federal public policy; unfair labor practices and representation issues; legal regulation of arbitration. Prerequisites: 6J:150, 6J:153, and 6J:158.

6J:153 Collective Bargaining **3 s.h.**
Integration of historical, political, social, economic, and legal threads underlying the public policy that governs collective bargaining and labor-management relations. Prerequisite: 6J:47.

6J:154 International Industrial Relations **3 s.h.**
Study of labor organizations; their structures and interrelationships with the social and economic systems in Western, Eastern, and Third World nations. Prerequisites: 6J:150, 6J:153, and 6J:158.

6J:156 Compensation Administration **3 s.h.**
Fundamental concepts of compensation theory; government and union influences; job analysis and evaluation; building and maintaining compensation structures; comparable worth; performance and pay. Prerequisites: 6J:150, 6J:153, and 6J:158.

6J:157 Training and Development **3 s.h.**
Research trends in the human resources training, education, and development activities within organizational settings; learning theories; models of training; interrelationships of management, career, and organizational development programs. Prerequisites: 6J:150, 6J:153, and 6J:158.

6J:158 Personnel Management **3 s.h.**
Application of social science research and concepts to decisions and processes involved in managing personnel in organizations; staffing, assessing, developing, and rewarding personnel. Prerequisite: 6J:100.

6J:159 Current Issues in Industrial Relations **3 s.h.**
Specialized topics in industrial society; may include management development and training, research methods in industrial relations, quantitative methods in industrial relations; topics vary. Prerequisites: 6J:150, 6J:153, and 6J:158.

6J:160 Personnel Selection 3 s.h.
Policies, procedures, and problems in selection of personnel by organizations; focus on job analysis, validation, legal constraints, criteria, and application of specific techniques. Prerequisites: 6J:150, 6J:153, and 6J:158.

6J:161 Individual Behavior in Organizations 3 s.h.
Principles of motivation, perception, learning, attitude formation, exchange, socialization, decision making, and task performance applied to behavior in organizational contexts. Prerequisites: 6J:100 or 6K:84, and 6K:71; or consent of instructor.

6J:162 Group Behavior in Organizations 3 s.h.
Basic characteristics of organizational structure and group processes from the perspective of social science concepts and theories; authority and communication structures, intergroup relations, leadership and group task performance. Prerequisites: 6J:100 or 6K:84, and 6K:71; or consent of instructor.

6J:163 Organizational Design and Operations 3 s.h.
Organization theory applied to problems of organizational design and operations; focus on structures and processes appropriate for particular stages of organizational development and change; case studies. Prerequisite: 6J:161 or consent of instructor.

6J:169 Selected Problems in Administrative Science 3 s.h.
Intensive study of problems in organizational behavior; emphasis on applying social science to chosen problems; bureaucracy, conflict, decision making. May be repeated. Prerequisites: 6J:161 and 6J:162, or consent of instructor.

6J:179 Strategic Planning Systems 3 s.h.
Formal systems for strategic planning; design requirements specified in terms of corporate strategy and organizations; analytical interactive computer models used to illustrate technology. Open only to final-semester business administration students.

6J:183 Managerial Information Processing and Decision Behavior 3 s.h.
Design of organizational information and decision systems in terms of behavioral science research on probability estimation, cut utilization, pattern recognition, and related human information processing issues.

6J:201 Directed Readings in Management and Organizations arr.
Individually guided readings on selected topics. Consent of instructor required for International Business Certificate students.

6J:202 M.A. Research Report 1 s.h.
Students in the nonthesis M.A. program identify a research topic and prepare a research report under faculty supervision; two research papers required.

6J:205 Contemporary Topics in Management and Organization arr.
Consent of instructor required.

6J:206 International Business Law 3 s.h.
Legal aspects of trade across national boundaries; regulation of persons, investment, and trade under national, regional, and international law; protection of foreign investments; role of multinational enterprises and organizations (EEC). Consent of instructor required.

6J:245 Training and Development 3 s.h.
Research-based examination of training and development programs; emphasis on societal, legal, and organizational factors affecting training program design, implementation, and evaluation; systemic relationships among training, careers, and the management of organizational development.

6J:250 Industrial Relations Systems 3 s.h.
Theory and international comparisons as the basis for understanding components and dynamics of industrial relations. Consent of instructor required.

6J:251 Concepts of Fair Employment 3 s.h.
Investigation of statutory and other legal bars to employment discrimination based on sex, age, color, religion, or nationality; focus on language of relevant antidiscrimination legislation and how courts and administrative agencies interpret and apply that language. Consent of instructor required.

6J:252 Collective Bargaining 3 s.h.
Study of labor relations, including theories of collective bargaining and techniques related to negotiations and dispute resolution; emphasis on dynamics of union-management interaction. Consent of instructor required.

6J:253 Economics of Industrial Relations 3 s.h.
Models of labor market behavior; emphasis on contract models, intertemporal substitution, and wage policy; empirical implications of models. Consent of instructor required.

6J:254 Public Sector Labor Relations 3 s.h.
Review and analysis of legal, economic, and institutional dimensions of collective bargaining in local, state, and federal levels of government; research on processes in bargaining, outcomes, and dispute settlement. Consent of instructor required.

6J:258 Human Resources Management 3 s.h.
Broad perspective of the role of human resources in organizations and the economy; selected personnel theories and research applied to organizational problems such as selection, training, performance evaluation, compensation, and employment rights. Consent of instructor required.

6J:259 Labor Arbitration 3 s.h.
Development of arbitration tracing; legal and institutional aspects; concepts underlying the rationale and purpose of arbitration; applications to current procedures and techniques in labor grievance and arbitration. Consent of instructor required. Same as 91:309.

6J:260 Personnel Selection 3 s.h.
Aspects of personnel selection, including professional and legal standards, job analysis techniques, validation strategies, criterion development, selection techniques, psychological tests, interviews, biographical data, assessment centers, and ethical issues. Consent of instructor required.

6J:262 Administrative Science II: Group Processes in Administration 3 s.h.
Understanding and implementing leadership and influence in groups and organizations; understanding social influence and group processes, including communication, conflict, and intergroup relations. Prerequisite: 6N:261 or consent of instructor.

6J:263 Organizational Design, Change, and Transformation 3 s.h.
Application of organization theory to design and management of companies both small and large; impact of changing technological and environmental factors on organizational operations and effectiveness; case studies.

6J:266 Behavioral Science and Business Organizations I 3 s.h.
Individual behavior, organizational aspects of individual behavior, introduction to group behavior in organizations; focus on reading and analysis of basic research reports and research-related issues. Prerequisite: 6N:261 or consent of instructor.

6J:267 Seminar in Organizational Theory 3 s.h.
Organizational theory and design; impact of changing environmental and technological factors on organizational structure and effectiveness; power, conflict, interorganizational network, organizational life cycles, and population ecology. Prerequisite: 6N:261 or consent of instructor.

6J:268 Seminar in Behavioral Science Problems in Organizations 3 s.h.
Theoretical and methodological topics in behavioral science treated in-depth; applied measurement techniques, behavioral economics, human information processing, theories of motivation, principles of rationality; topics vary. Prerequisite: 6N:261 or 6J:266.

6J:269 Meta-Analysis in Behavioral and Social Sciences 3 s.h.
Set of methods for quantitatively integrating findings across studies in the behavioral and social sciences: overall effect size or correlation, whether conflicting findings documented in research literature are due to moderators (interactions) or statistical and measurement artifact. Consent of instructor required.

6J:270 Research Methods in Management and Organizations 3 s.h.
Approaches to identifying, defining, and researching issues in the fields of industrial relations, human resources, organization behavior, organizational theory and strategy; developing models and hypotheses, selecting research designs, finding and collecting data, managing data, and disseminating findings. Consent of instructor required.

6J:271 Compensation Management 3 s.h.
Government and union influences, equity in compensation, labor markets, job pricing and evaluation, wage and salary structures, individual wage determination, employee benefits, and issues in compensation administration. Consent of instructor required.

6J:272 Trade Union Policy and Structure 3 s.h.
Analysis of American union structure, administration, and policies; union political involvement; unions as organizations; union effects on wages, benefits, and other employment terms; causes of union growth and decline. Consent of instructor required.

6J:273 Measurement Theory and Methods in the Behavioral and Social Sciences 3 s.h.
Classical measurement theory and methods as applied to psychological tests, questionnaires, and ratings of work-related and other performances and behaviors; topics include reliability theory and methods, instrument construction and item analysis, criterion construction, validity, combining and weighting instruments, and cross-validation; requires knowledge of basic statistical methods.

6J:279 Strategy Formulation: Industry Analysis—M.B.A. 3 s.h.
Industrial organization analysis applied from a managerial viewpoint; competitive strategy within various industry structures; rivalry, entry/mobility deterrence, strategic groups, industry evolution; theories of vertical and horizontal integration; cooperative strategies, including joint ventures. Open only to graduating master's degree candidates. Prerequisite: 6N:276.

6J:283 Organizational Decision Behavior 3 s.h.
Application of behavioral decision theory to problems of managerial inference, information systems design, decision definition, and evaluation of decision-making processes. Consent of instructor required.

6J:289 Research in Corporate Strategy 3 s.h.
Readings in research literature on strategic management and methodology: industrial organization, strategy concept and content, strategic management processes, organizational governance and control; methodologies include case, archival, and survey research. Consent of instructor required.

6J:290 Thesis in Management and Organizations arr.
Consent of instructor required.

6J:299 Field Studies in Management and Organizations 3 s.h.
Extensive field investigation of an industrial relations or human resource topic in a functioning organization; independent study designed and completed under faculty supervision.

MANAGEMENT SCIENCES

Chair: Colin E. Bell
Professors: Colin E. Bell, Andrew F. Daughety, Gary C. Fethke, Raj Jagannathan, Kenneth Kortanek (Murray Professor), Johannes Ledolter, Timothy J. Lowe, Jennifer Reinganum
Associate professors: Eleanor M. Birch, Warren J. Boe, Amitava Dutta, Yinyu Ye
Assistant professors: Suranjan De, June Park
Undergraduate degree offered: B.B.A. in Management Sciences
Graduate degrees offered: M.B.A.; M.A., Ph.D. in Business Administration

Undergraduate Program

Management sciences majors participate in a variety of educational experiences that develop their knowledge of managerial decision-making systems. Skills in applying this knowledge are acquired by developing quantitative models, utilizing computer technology, and creating database systems. Each degree track fits one of several career options open to departmental majors.

Students prepare for a variety of career opportunities in both manufacturing and service organizations. Typical starting positions include computer programmers, systems analysts, sales representatives with computer companies, and management trainees. Entry-level positions in operations management include materials management, line supervision, purchasing, and manufacturing systems.

Two tracks of study are available to the management sciences major: management information systems and operations management. Course requirements for each track are as follows.

Management Information Systems Track

6J:161 Individual Behavior in Organizations
6J:163 Organizational Design and Operations
6K:176 Managerial Decision Models
6K:180 Management Information Systems
6K:181 Systems Analysis and Design

One computer science programming course (22C:16-17 recommended)

One of the following:

6J:183 Managerial Information Processing and Decision Behavior
6K:182 Applications of Database Management Systems
6K:184 Production Planning and Control

Operations Management Track

6J:161 Individual Behavior in Organizations
6J:163 Organizational Design and Operations
6K:84 Production Management (may be taken in place of 6J:100)
6K:176 Managerial Decision Models
6K:180 Management Information Systems
6K:184 Production Planning and Control

One of the following:

6J:153 Collective Bargaining
6J:158 Personnel Management
6K:181 Systems Analysis and Design
6K:182 Applications of Database Management Systems

Graduate Programs

Master of Arts

The Master of Arts program in management sciences is designed for students who seek either an opportunity for specialization or a research experience. The general requirements are specified in the description of the Master of Arts in business administration. See "Interdepartmental Graduate Programs" in the College of Business Administration introductory section of the *Catalog*. Students must consult with a faculty adviser to prepare a plan of study for the master's degree.

Doctor of Philosophy

Candidates who want to earn a Ph.D. degree in management sciences should refer to the description of the Doctor of Philosophy program in "Interdepartmental Graduate Programs" in the College of Business Administration introductory section of the *Catalog*.

Courses

Primarily for Undergraduates

6K:000 Cooperative Education Internship **0 s.h.**

6K:70 Computer Analysis **3 s.h.**
Introduction to the computer and its uses in operation and management of organizations; topics include computer systems terminology, introduction to programming, management information systems, and use of applications software. Prerequisites: 22M:17 and 22S:8.

6K:71 Statistical Analysis **3 s.h.**
The use of statistics for solving management problems; topics include regression, ANOVA, decision theory, and forecasting. Prerequisites: 22M:17 and 22S:8.

6K:84 Production Management **3 s.h.**
Organization and management of manufacturing enterprises; production design and process planning; plant layout and materials handling, work simplification and measurement, production, inventory control. Prerequisites: 6E:1, 6E:2, and 6K:70.

For Undergraduates and Graduates

6K:101 Directed Readings **arr.**
Individually guided readings on selected topics in management sciences. Consent of instructor required.

6K:173 Managerial Economics **3 s.h.**
Economic analysis applied to basic problems encountered in a marketing, finance, and production; foundation for more specialized work in these fields. Prerequisites: 6E:1, 6E:2, and 6K:71.

6K:176 Managerial Decision Models **3 s.h.**
Mathematical programming, including linear, nonlinear, and dynamic programming, with applications in economics and management; classical optimization techniques, transportation, and network flow problems. Prerequisites: 6K:70 and 6K:71.

6K:180 Management Information Systems **3 s.h.**
Nature of systems; description and use of management information systems; survey of tools used in systems design and analysis; use of decision support systems. Prerequisites: 6K:70 and 6K:71.

6K:181 Systems Analysis and Design **3 s.h.**
Design and implementation of an information system; students are assigned a project that includes determination of information needs, system design, and development of information plans, followed by construction of prototype information system. Prerequisite: 6K:180, and 22C:16 or 22C:9.

6K:182 Applications of Database Management Systems **3 s.h.**
Design and implementation of a database using a relational DBMS; emphasis on issues of logical and physical design, database administration, concurrency control, and maintenance. Prerequisite: 6K:180.

6K:184 Production Planning and Control **3 s.h.**
Computer-based systems for production planning, scheduling, and inventory control in operations management; emphasis on recent applications in industry, including Material Requirements Planning (MRPII) and Just-in-Time (JIT) Systems. Prerequisites: 6K:70, 6K:71, and 6K:84.

Primarily for Graduates

6K:201 Directed Readings **arr.**
Individually guided readings on selected topics in management sciences. Consent of instructor required.

6K:202 M.A. Research Report **1 s.h.**
A major paper. Open only to nonthesis M.A. candidates. Consent of instructor required.

6K:275 Analytical Models in Management Sciences **3 s.h.**
Operations research through student team case-study; varied source material including ongoing firms; emphasis on mathematical modeling, computer implementation, communication, and skills.

6K:277 Management Science Topics **3 s.h.**
Development of mathematical models for decision problems; linear, nonlinear, quadratic, integer, and dynamic programming; selected stochastic and game theoretic systems. Consent of instructor required.

6K:278 Forecasting **3 s.h.**
Forecasting used in business; ad hoc models such as moving average and exponential smoothing; structured models such as regression and Box-Jenkins time series models. Prerequisite: 6N:271 or equivalent.

6K:280 Management Information Systems—M.B.A. **3 s.h.**
Software, hardware, and organizational fundamentals of management information systems; hardware components and characteristics, operating systems, systems software and applications software, system life cycle; management issues; foundation for advanced MIS courses. Prerequisites: 6N:193 and 6N:271.

6K:281 Management Systems Design **3 s.h.**
Structured approach to analysis and design of computer-based business information systems; structured analysis tools such as data flow diagrams, data dictionary, decision tables, and Structured English; structured design tools such as structure charts and pseudocode; logical design of databases. Prerequisite: 6K:280 or consent of instructor.

6K:282 Applied Database Management Systems **3 s.h.**
Hierarchical, network, and relational data models; approaches to logical and physical database design, database administration; concurrency control, maintenance issues; design and implementation of a database using a relational DBMS. Prerequisite: 6K:280.

6K:284 Production Management **3 s.h.**
Managerial issues in operations, including formulation of manufacturing strategy for a business, management of technology in operations, and capacity management.

6K:285 Research Seminar in Management Information Systems **3 s.h.**
In-depth study of one or more topics such as structured systems design, fourth generation languages, communications, economics of computers, computer security issues. Consent of instructor required.

6K:286 Optimization Methods I **3 s.h.**
Mathematical programming models including linear programming, integer programming, transportation models, large-scale linear programming, network flow models, and convex separable programming. Prerequisites: calculus and linear algebra.

6K:287 Optimization Methods II **3 s.h.**
Classical optimization methods including dynamic programming, network models, integer programming, and nonlinear programming. Prerequisite: 6K:286.

6K:288 Applied Stochastic Processes **3 s.h.**
Probability theory, Markov chains and applications, Markovian decision processes, the exponential distribution and Poisson processes, continuous time Markov chains, queuing models, renewal theory and its application. Prerequisites: 6K:286, and 22S:120 or 22S:154.

6K:290 Thesis in Management Sciences **arr.**
For Ph.D. candidates. Consent of instructor required.

6K:291 Operations Planning and Control **3 s.h.**
In-depth study of research on planning and control of production systems; aggregate production planning, production and work force scheduling, project planning and scheduling, vehicle schedule, inventory theory, forecasting, purchasing models, manufacturing planning, and control systems. Consent of instructor required.

6K:292 Operating Systems Design 3 s.h.
In-depth study of the design of production and logistics systems; topics may include facilities location and layout, assembly line planning, group technology, quality assurance and control, manufacturing process functions, capacity planning, product process development and design, technology management, manufacturing strategy. Consent of instructor required.

6K:293 Research Seminar in Operations Management 3 s.h.
In-depth study of selected topics of interest in operations management, such as capacity planning, facilities management, technology management, product design and development, inventory theory, production scheduling. Consent of instructor required.

6K:294 Artificial Intelligence for Management 3 s.h.
Alternative AI knowledge representation and search methodologies; applications including expert systems and automated AI planning; practical experience with an AI programming language and expert system shell. Consent of instructor required.

6K:295 Logistics Management and Analysis 3 s.h.
Design and analysis of single host, multiple host networks, and packet switching networks; impact of telecommunications on distributed processing; configuration, performance evaluation, cost/benefit analysis, resource tracking, fault management. Consent of instructor required.

6K:296 Introduction to Data Communications 3 s.h.
Basic concepts in computer communications: the computer-communication system, hardware, data transmission principles, data link protocols, network configurations; examples of existing communication networks. Prerequisite: 6K:280.

MARKETING

Chair: Doyle L. Weiss
Professors: David J. Curry, Peter C. Riesz, Randall L. Schultz, Doyle L. Weiss (Murray Professor)
Associate professors: Gary J. Gaeth, Gerard J. Tellis
Associate professor emeritus: E. John Kottman
Assistant professors: William J. Burns, Catherine A. Cole, Siva K. Balasubramanian
Visiting assistant professor: Raj Sethuraman
Adjunct professor: Gerald J. Eskin
Undergraduate degree offered: B.B.A. in Marketing
Graduate degrees offered: M.B.A.; Ph.D. in Business Administration

Undergraduate Program

The Department of Marketing offers courses that help undergraduate students understand the social and economic roles of marketing and prepares them for marketing careers.

Several decades ago, the study of marketing dealt almost exclusively with business activities involved in the flow of goods from production to consumption. Today the study of marketing includes principles that are more widely applicable; they are as relevant in the marketing of the arts, sports, and social causes as they are in the marketing of goods and services. A major in marketing includes study in the behavioral sciences, communications, statistical analysis, and computer methods as well as marketing's functional areas.

Students graduating with majors in marketing may find opportunities for employment as market analysts, merchandise managers, buyers, community action agents, purchasing agents, advertising trainees, brand management trainees, or sales representatives, in a variety of profit and nonprofit organizations.

The requirements for the Bachelor of Business Administration degree with a major in marketing are as follows.

6M:134 Marketing Research 3 s.h.

At least three, but no more than four, of the following:

6M:135 Consumer Behavior 3 s.h.
6M:137 Advertising Theory 3 s.h.
6M:139 Sales Management 3 s.h.
6M:147 Marketing Management 3 s.h.
6M:151 International Marketing 3 s.h.
6M:190 Topics in Marketing 3 s.h.

Graduate Programs

See "Interdepartmental Graduate Programs" in the College of Business Administration introductory section of the *Catalog*.

Courses

Primarily for Upper-Division Undergraduates

6M:000 Cooperative Education Internship 0 s.h.
Prerequisites: a grade-point average of 3.00 in 6M:100 and 6M:134.

6M:100 Introduction to Marketing 3 s.h.
General introduction to the structure of marketing; marketing environment of an organization and its strategies with respect to marketing decisions; buyer behavior and management of marketing decisions. Junior or higher standing required. Prerequisite: 6E:1. Pre- or corequisite: 6A:1.

For Undergraduates and Graduates

6M:101 Directed Readings in Marketing arr.
Individually guided readings on selected topics in marketing. Consent of instructor required.

6M:134 Marketing Research 3 s.h.
Introduction to marketing and distribution research methods and role of marketing information as a management tool in decision making. Prerequisites: 6M:100 and 6K:71.

6M:135 Consumer Behavior 3 s.h.
Emphasis on behavioral aspects of marketing; discussion of influences on buying behavior, including learning, perception, dissonance, imagery, symbolism, personality, attitude, self, role, life-style, reference groups, culture, social class, and family; strategic use of persuasive communications in marketing. Prerequisite: 6M:100.

6M:137 Advertising Theory 3 s.h.
Advertising as a promotional force; emphasis on theory, planning, and resulting strategic and tactical decisions made by advertising executives. Prerequisite: 6M:100.

6M:139 Sales Management 3 s.h.
The nature of personal selling and management of the sales force; emphasis on recruiting, selection, and training of sales representatives; problems in the allocation of sales effort, supervision, and control. Prerequisite: 6M:100.

6M:147 Marketing Management 3 s.h.
Marketing problems of organizations; emphasis on the marketing manager's role in developing and presenting goal-oriented marketing strategies; use of behavioral science concepts to understand buyers; study of marketing decision areas, including advertising, personal selling, product planning, pricing, distribution, competitive strategies; participation in computerized business games. Prerequisites: 6M:100 and two additional marketing courses.

6M:151 International Marketing 3 s.h.
Designed for advanced undergraduates; topics include international versus domestic marketing, cultural considerations, market entry strategies, applying marketing principles in foreign markets, review of currency markets, developing specific markets in Western Europe and the Pacific Rim, developing workable plans and programs. Prerequisite: 6M:100.

6M:190 Topics in Marketing 3 s.h.
New or special courses at the undergraduate level not regularly offered. Students may register for credit for more than one section. Consent of instructor required. Prerequisite: 6M:100.

Primarily for Graduates

6M:201 Directed Readings in Marketing arr.
Individually guided readings on selected topics in marketing. Consent of instructor required.

6M:230 Marketing Research Methods 3 s.h.
Methods of design, analysis, and interpretation of marketing research studies, including surveys and laboratory and marketplace experiments; value of information, sampling, sources of bias, instrument construction, and interpretation of scanner data, geodemographic data, applications of integrated research systems. Prerequisites: 6N:196 and 6N:271. Recommended: 6N:193 and 6N:197.

6M:231 Industrial Marketing 3 s.h.
Industrial buyer behavior, buyer-seller relationships, interaction product policy and market segmentation, distribution and selling systems; skill development in formulating marketing strategies for industrial products and services and in industrial marketing problem solving and decision making. Prerequisite: 6N:196.

6M:232 Buyer Behavior 3 s.h.
Study of the behavior of consumers and industrial buyers; examination of research methods and findings from behavioral sciences related to consumption of products and services; application of consumer behavior concepts to managerial decision making. Prerequisite: 6N:196.

6M:233 Service Marketing 3 s.h.
Consumption and marketing of services; problems faced by service marketing professionals. Prerequisite: 6N:196.

6M:234 Advanced Marketing Management 3 s.h.
Advanced topics in marketing from a managerial viewpoint. Prerequisite: 6N:196. Pre- or corequisite: 6M:230.

6M:235 International Marketing 3 s.h.
Issues in entering overseas markets and in conducting marketing operations on international as opposed to domestic scale; focus on identifying and evaluating opportunities in non-U. S. markets, developing and adapting marketing strategies to specific national needs, and coordinating strategies for global marketing. Prerequisite: 6N:196.

6M:236 Advertising and Promotion Strategy 3 s.h.
Examination of marketing communications as dialogue between producers and consumers and how promotional mix evolves; emphasis on advertising, sales promotion, and branding; for M.B.A. students with no prior course work in advertising, marketing communications, or promotion strategy. Prerequisite: 6N:196.

6M:237 Field Studies in Marketing 3 s.h.
Student groups plan, design, carry out, and report on a marketing research project for a profit or nonprofit client organization; students communicate with managers, apply marketing research, meet deadlines, and convert research findings into action recommendations for management. Prerequisites: 6N:196 and 6N:271. Recommended: 6M:230.

6M:238 Contemporary Topics in Marketing 3 s.h.
Special topics of contemporary interest. Open only to graduate students. Offered for credit in more than one section. Prerequisite: 6N:196.

6M:239 Analysis for Marketing Strategy 3 s.h.
Analysis and decision making within the context of marketing programs; emphasis on functions of marketing research and marketing models as they pertain to the role of the marketing manager; extensive use of marketing cases structured around spreadsheet analysis. Prerequisites: 6N:196 and 6N:271. Recommended: 6M:230.

6M:241 Management Models—Ph.D. **3 s.h.**
Analytic models that support marketing decision making; emphasis on structure and usage of models for specific decision situations; case studies. Consent of instructor required.

6M:242 Marketing Models—Ph.D. **3 s.h.**
Examination of theoretical and operational models in marketing with emphasis on recent advances; in-depth criticism of models, participation in model development project. Consent of instructor required.

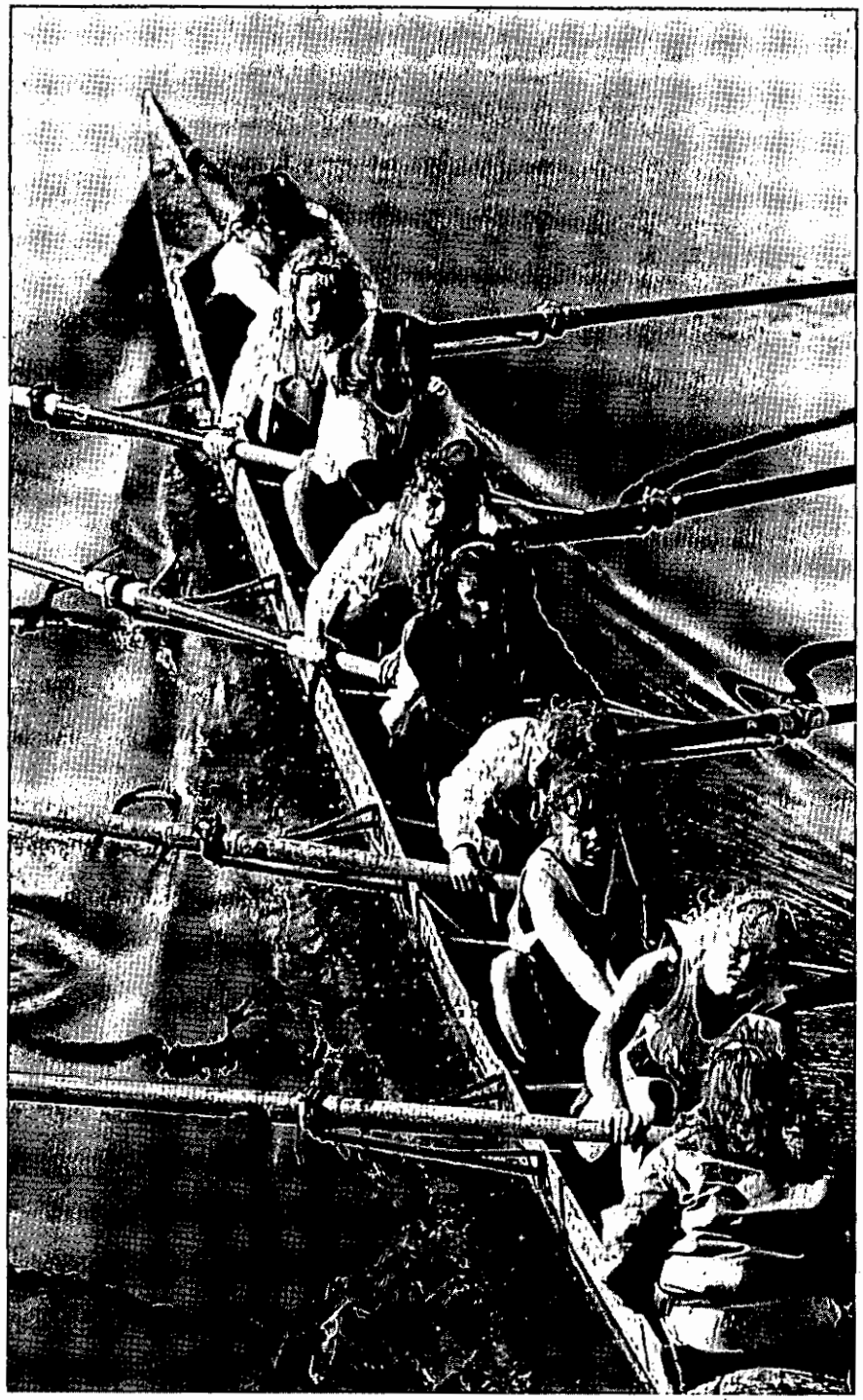
6M:243 Research in Consumer Behavior—Ph.D. **3 s.h.**
Critical examination of recent research, in-depth study of research methods. Consent of instructor required.

6M:244 Multivariate Applications—Ph.D. **3 s.h.**
Survey of major topics in multivariate analysis: principal components, factor analysis, canonical correlation, discriminant analysis, linear structural relations; emphasis on the structural commonality across procedures, applications of procedures to marketing research problems. Recommended: substantial familiarity with linear algebra and inferential statistics. Consent of instructor required.

6M:245 Research Workshop—Ph.D. **arr.**
Individually guided research projects on appropriate topics in marketing. Consent of instructor required.

6M:246 Seminar in Marketing—Ph.D. **arr.**
Examination of current marketing literature and current research interests of faculty and students. Consent of instructor required.

6M:290 Thesis in Marketing **arr.**
Consent of instructor required.



College of Dentistry

Dean: James H. McLeran
Executive associate dean: John C. Montgomery
Assistant dean for research and director of Dows Institute: Christopher Squier
Associate dean for academic affairs: Nelson S. Logan
Associate dean for clinical activities: Thomas V. Gardner
Assistant dean for extramural affairs: C. Frederic Erbe
Associate dean for business and financial administration: M.J. Brennan
Degrees offered: D.D.S., M.S.

Doctor of Dental Surgery

The College of Dentistry is both administratively and physically an integral part of the University. It draws on and contributes to the University's diverse resources, and its students enjoy all the advantages and privileges enjoyed by the general student body. The college benefits particularly from its cooperative relationship with the Colleges of Medicine, Nursing, and Pharmacy in The University of Iowa Health Center, whose teaching, research, and service activities have earned international recognition.

The basic educational program leading to the Doctor of Dental Surgery (D.D.S.) degree consists of a minimum of three years of preprofessional study and four years of study in the College of Dentistry. The dental curriculum consists of five basic units.

Basic Sciences

Gross anatomy; biochemistry; histology; physiology; general pathology; oral pathology; pharmacology; microbiology.

Restorative Dental Sciences

Gross, microscopic, and radiographic dental anatomy; dental materials; endodontics; operative dentistry; fixed partial prosthesis; removable prosthesis.

Oral Medicine

Preventive dentistry; oral diagnosis; dental radiology; oral pathology; anesthesiology and pain control; oral surgery; periodontology.

Community Dentistry

Ethics; epidemiology; nutrition; preventive dentistry; community health; principles of human behavior; dental economics; dental jurisprudence; geriatrics.

Pediatric Dentistry

Facial growth and development; pediatric dentistry and orthodontics.

To achieve a close correlation of the basic sciences with clinical disciplines, the student is introduced to clinical patient-treatment situations during the first year.

The second-year program continues the basic sciences and technical courses, plus definitive clinical patient treatment.

Third-year dental students rotate through a series of clerkships, which expose them to each of eight clinical disciplines.

Fourth-year dental students are involved in the delivery of comprehensive dental care in an environment that simulates conditions in private dental practice. They also are exposed to various extramural health programs that include hospitals, mental health institutes, nursing homes, and the Special Patient Care Clinic. They also may participate in the Colorado Migrant Worker Program or the Foreign Dental School Exchange Program, which give exposure to facets of dentistry usually not observable in an academic setting.

Promotions and Graduation

Student promotions and graduation are determined by the collegiate academic and professional performance committee, which is made up of individuals appointed by the dean from the basic, preclinical, and clinical sciences and from other academic areas of the college. The performance committee may recommend to the dean that a student withdraw from the college or repeat specific courses when the student is deemed generally unprepared to be promoted or to enter the dental profession.

Committee for Appeals

When a student has been asked to withdraw from the college or wants special consideration of problems concerning promotion or graduation, the student may appeal to the dean. All appeals are heard by an ad hoc committee appointed by the dean. The ad hoc committee investigates new information that previously has not been available or that, for some reason, has not been discussed as fully as the student feels it should have been. The committee determines whether this new information, or important new insights that may have been gained, could have influenced the collegiate academic and professional performance committee's decision. The recommendation of the appeals committee is submitted to the dean for final action.

Dentistry Licensure Examination

Iowa and the states of Colorado, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota, Wisconsin, and Wyoming belong to the Central Regional Dental Testing Service, which serves as the testing agency for clinical examinations for licensure in these states. Examinations are administered at several testing sites located at schools of dentistry within the region. Examination dates are determined by the Central Regional Dental Testing Service and are available from its administrative secretary.

For a five-year period, member states accept successful completion of Central Regional Dental Testing Service requirements in lieu of their individual state's clinical examination requirements. The license application is then filed with the individual state board of dentistry.

Most states also require the National Boards, conducted by the American Dental Association, in lieu of individual state written examinations. A jurisprudence examination also is required in many states, including Iowa.

Facilities

The Dental Science Building, a major unit of the Iowa health center campus, enables the college to accelerate its research activities and facilitates the development of interdisciplinary communication in health center testing, research, and patient care activities. The health center includes the Colleges of Medicine, Nursing, and Pharmacy; the Bowen Science Building; The University of Iowa Hospitals and Clinics; and the Hardin Library for the Health Sciences. The Hardin Library houses all of the University's special health science holdings, a total of 198,750 volumes, including more than 18,000 volumes on dentistry and allied scientific subjects, and the more than 280 dental journals the college currently receives. This library receives more than 2,600 journals from the combined health professions.

The Dental Science Building consists of two connected, four-story wings located on either side of a mall. The south wing is devoted to clinical teaching, with various departmental clinic facilities, support laboratories, clinical research space, offices, and a cafeteria. The north wing houses teaching laboratories, research laboratories, administration area, educational media center, and programs in community dentistry.

Student Organizations

All dental students are eligible for membership in the American Student Dental Association through its local chapter. There also are local chapters of the American Association of Dental Schools, the American Association of Dental Research, the American Association of Women Dentists, the American Society of Dentistry for Children, and the Student National Dental Association. Students who rank in the upper 12 percent of their senior class are eligible for election to Omicron Kappa Upsilon, national scholastic honorary dental society. Two national dental professional fraternities, Delta Sigma Delta and Psi Omega, have chapter houses at Iowa. Both fraternities have housing available to male and female dental students. In addition, they provide both academic and social activities for students and their spouses.

Expenses

The College of Dentistry maintains a Supply-Instrument Management System (SIMS), which provides students with instruments and supplies necessary throughout dental training.

The SIMS usage fee for the D.D.S. degree is payable in installments over the first three years of the program.

A fee for expendable laboratory supplies is charged each of the first two years. A $100 breakage fee also must be deposited; the deposit is refundable upon graduation or termination of enrollment.

Financial Aid

Financial assistance for dental students is based on need. Students applying for Health Professions Loans must submit the College Scholarship Service Financial Aid Form (FAF), which includes an evaluation of parents' income and assets. Needy dental students are eligible for Health Professions Loans, Perkins Loans, state grants, and Stafford Loans. Interest on these loans is deferable while the student is in school, and the loans are repayable over an extended period of time after the course of study is completed.

Short-term loans are available through the financial aid coordinator at the College of Dentistry.

See financial aid in the "Learning at Iowa" section of the *Catalog* or inquire at the Office of Student Financial Aid for updated information regarding financial assistance available to dental students.

Dentistry Research Assistantships (DRA)

Dental research assistantships are awarded each year to qualified entering dental students. The DRA provides financial support of $2,100 per year for as many as four years, if the student maintains an appropriate level of performance. Nonresidents receive the same stipend and fees at resident rates. Awardees are engaged as assistants in research working with faculty mentors.

Other Assistantships

The college offers assistantships that provide financial support for as many as four years, based on satisfactory performance in school. Awardees receive a stipend and nonresidents pay tuition and fees at resident rates.

Minorities

Financial assistance (grants and loans) and counseling services are available to minority students who qualify under The University of Iowa's Educational Opportunity Program and the Opportunity at Iowa Program.

Arkansas Contract

Under an agreement with The University of Iowa College of Dentistry, the state of Arkansas makes supplemental tuition payments for its residents who are dentistry students at Iowa. These payments enable the Arkansas students to pay the equivalent of Iowa resident tuition for their study here.

Admission

Applicants must submit a completed application form to the American Association of Dental Schools Application Service (AADSAS). The AADSAS forms are available from the University Office of Admissions or the College of Dentistry Academic Affairs Office.

Applications are accepted beginning June 1 of the year prior to the year for which application is made. Completed applications should be on file at AADSAS by November 30. Applicants should apply as early as possible and should not delay until after the Dental Admission Test (DAT) is taken. Notifications of acceptance are sent beginning December 1.

Prospective dental students are encouraged to embark on an education program that leads to a standard bachelor's degree. This allows students to consider a combined program that enables them to earn a standard bachelor's degree from their undergraduate college upon completion of the freshman year in dentistry (see "Combined Liberal Arts-Dentistry Program" in this section of the *Catalog*).

Predental Studies

The basic academic requirement for admission to the College of Dentistry is the completion of no fewer than 94 semester hours of academic study at an accredited college. In exceptional circumstances, candidates with fewer than 94 semester hours of college work are considered for admission if their performance and potential for the dental profession are considered outstanding.

The predental program of study should include:

English: satisfactory accomplishment in English composition, rhetoric, and speech commensurate with the academic requirements for a bachelor's degree at the college attended.

Physics: one year (equivalent to 8 semester hours), of which one-fourth must be laboratory work.

Chemistry: two years (equivalent to 16 semester hours), of which one year (equivalent to 8 semester hours) must be in organic chemistry, and of which one-fourth must be laboratory work.

Biology: one year (equivalent to 8 semester hours), which must include appropriate laboratory work; requirement may be satisfied by a one-year course in general mammalian biology. Courses in histology and cell physiology are also recommended.

Electives: sufficient course work in the social sciences, philosophy, psychology, history, foreign languages, and mathematics to provide a well-rounded educational background.

Combined Liberal Arts-Dentistry Program

Students who are enrolled in a baccalaureate program at The University of Iowa may be allowed to include the first year of dentistry to complete their elective hours requirements toward the bachelor's degree.

The provision for acceptance by the College of Liberal Arts of 30 semester hours of elective credit earned in any other college of the University allows students who enter the College of Dentistry to obtain a bachelor's degree from the College of Liberal Arts after successfully completing the freshman year in dentistry. To take advantage of this plan, students must fulfill all specific requirements for the bachelor's degree, including the General Education Requirements and the requirements for a major. Students also must satisfy the College of Liberal Arts residence requirement before enrolling in the College of Dentistry. See "Early Admission to Medicine or Dentistry" in the College of Liberal Arts section of the *Catalog*.

Grade-Point Average Requirement

Applicants should have a cumulative grade-point average of at least 2.50. The admissions committee gives special consideration to the quality of applicants' course work in the predental sciences in addition to the cumulative grade-point average.

Interviews

Personal interviews are required of applicants for admission to the College of Dentistry. Applicants will be contacted to arrange an interview, usually after the AADSAS application is received by the admissions office.

Required Dental Admission Test

All applicants must complete the Dental Admission Test (DAT) sponsored by the Council on Dental Education of the American Dental Association. Tests are given in spring and fall; The University of Iowa is a testing center.

Applicants must take the test no later than fall in order to be admitted for the following year. Test application forms are available from the University Office of Admissions; the College of Dentistry Academic Affairs Office; or the American Dental Association, 211 East Chicago Avenue, Chicago, Illinois 60611. Test application deadlines are typically 30 to 45 days prior to the exam.

Deposit by Accepted Applicants

Applicants accepted before February 15 are required to submit a $500 deposit within 30 days after notification of admittance.

Applicants admitted after February 15 must submit the deposit within two weeks after notification of admittance. This deposit is not refundable, but is credited toward the first fee payment. Applicants who fail to make the deposit within the time specified forfeit their place in the entering class.

Additional Admission Considerations

Fulfillment of the specific requirements listed for admission does not ensure admission to the College of Dentistry. From applicants meeting minimum requirements, the admissions committee selects those who appear best qualified for the study and practice of dentistry. The committee considers applicants' academic averages, science averages, Dental Admission test scores, letters of recommendation, the interview, and other factors.

Early Admissions

The College of Dentistry has an early admissions program set up with The University of Iowa; Buena Vista College in Storm Lake, Grinnell College in Grinnell, and Luther College in Decorah, Iowa; Augustana College in Rock Island, Illinois; and Prairie View A & M University in Prairie View, Texas. The Dental Early Admission Program (DEAP) allows academically motivated students interested in a dental career to be admitted as early as the first year of their undergraduate college education while postponing matriculation to the College of Dentistry until they have completed three years of liberal arts education. During these three years, students are engaged in a liberal arts curriculum that incorporates the dental prerequisite courses. Once selected for the program, students must maintain a 3.20 grade-point average to assure matriculation to The University of Iowa College of Dentistry.

Graduate and Postgraduate Study

Programs of study leading to the Master of Science degree are offered by the College of Dentistry's Departments of Dental Hygiene, Prosthodontics, Operative Dentistry, Endodontics, Oral Pathology and Diagnosis, Oral and Maxillofacial Surgery, Orthodontics, Pediatric Dentistry, Periodontics, and Preventive and Community Dentistry.

Admission to any of the graduate programs requires satisfaction of all requirements for admission to the Graduate College, possession of the Doctor of Dental Surgery degree or its equivalent (except for dental hygiene), and departmental approval.

Departments also offer postgraduate programs of study designed as preparation for clinical specialty practice. These programs do not lead to an academic degree. Prerequisites for admission to the postgraduate programs are the same as for graduate programs. A certificate is awarded upon satisfactory completion of the postgraduate program.

Graduate students who are interested in taking a course in electron microscopy may do so by registering for one of the following.

52:156 Scanning Electron Microscopy and X-ray Microanalysis (same as 2:156, 12:156)	3 s.h.
61:218 Electron Microscopy Techniques (same as 2:218, 37:218)	3 s.h.
61:220 Advanced Electron Microscopy (same as 2:220, 90:220)	3 s.h.
52:272 Advanced Scanning Electron Microscopy (same as 12:272)	3 s.h.

Basic Sciences in the Dental Curriculum

The following science courses are offered by departments in colleges other than dentistry and are a required part of the dental curriculum.

60:101 Human Gross Anatomy for Dental Students	6 s.h.
60:112 General Histology for Dental Students	4 s.h.
60:114 Oral Histology and Embryology	1 s.h.
61:112 Health Sciences Microbiology	4 s.h.
69:203 Introduction to Human Pathology	arr.
71:111 Pharmacology for Health Sciences: Dental	5 s.h.
72:152 Mammalian Physiology	4 s.h.
99:161 Biochemistry for Dental Students	4 s.h.

Courses

Nondepartmental

112:100 Transfer Credits Accepted arr.

112:115 Dental Materials 1 s.h.

112:120 First-Year Continuing Session 0 s.h.

112:145 Introduction to Geriatric Dentistry 2 s.h.
Aspects of aging ranging from cellular to social, psychological, and cultural; disease processes in the elderly that affect dental treatment, as well as normal aging and pathological changes in the elderly patient that affect treatment and patient management.

112:150 Second-Year Continuing Session 0 s.h.

112:165 Bioscience Options arr.
Special project courses; emphasis on the scientific basis of dental practice.

112:168 Dental Therapeutics 1 s.h.
Review of medications taken by patients that may have implications for dental treatment; review of medications that dentists may prescribe.

112:170 Third-Year Continuing Session 0 s.h.

112:175 Program Abroad arr.
Opportunities for foreign dental studies negotiated with the faculties of dental colleges abroad.

112:180 Fourth-Year Clinics 0 s.h.

112:199 Advanced Clinical Comprehensive Dentistry 0 s.h.
Comprehensive clinical management of dental emergencies and advanced operative dentistry procedures.

112:200 Seminars in Dental Research 1 s.h.
Current state of research in a broad variety of areas in dentistry. Prerequisite: 112:210.

112:210 Dental Sciences Research Methodology arr.
Description and illustration of practical and experimental procedures in dental research; evaluation of literature and design, writing of research protocols.

112:251 Pathophysiology of Skin and Oral Mucosa 2 s.h.
Biology of skin and oral mucosa and changes in the behavior of the tissues in a variety of physiological and pathological conditions. Offered fall semesters of odd years. Prerequisite: 112:210.

112:252 Pathophysiology of Bone 2 s.h.
Biology of bone, including factors in a variety of diseases associated with bone. Offered fall semesters of odd years. Prerequisite: 112:210.

112:253 Biological Aspects of Neoplasia 2 s.h.
Biology of cancer, with emphasis on oral neoplasia. Offered fall semesters of even years. Prerequisite: 112:210.

112:254 Pathophysiology of Salivary Glands and Saliva 2 s.h.
Innervation, structure, and function of the glands and their secretions in health and disease, and their role in the oral environment. Offered spring semesters of odd years. Prerequisite: 112:210.

112:255 Pathophysiology of the Pulp-Dentin Complex 2 s.h.
Biology of the tissue, with emphasis on pathological changes. Offered spring semesters of even years. Prerequisite: 112:210.

112:256 Pathophysiology of the Tooth-Support Structures 2 s.h.
Biology of the periodontal tissues; current status of knowledge of periodontal disease based on critical reviews of selected scientific papers. Offered fall semesters of even years. Prerequisite: 112:210.

112:257 Current Concepts of Cariology 2 s.h.
Etiology of dental caries, its pathogenesis, and the development of preventive measures based on this knowledge. Offered spring semesters of odd years. Prerequisite: 112:210.

112:258 Biology and Treatment of Craniofacial Anomalies 2 s.h.
Craniofacial growth, molecular aspects of development, and the scientific basis underlying current methods of treatment. Offered spring semesters of even years. Prerequisite: 112:210.

112:259 Infectious Diseases 2 s.h.
Integration of the biological knowledge of infectious diseases relevant to clinical dentistry, including information on conditions such as hepatitis B, AIDS, and herpes. Offered fall semesters. Prerequisite: 112:210.

112:269 Advanced Dental Therapeutics 1 s.h.
Antimicrobial, analgesic, and related therapies as they pertain to dental patients; emphasis on drug/drug interactions, treatment plan modification, and case analysis of the medically compromised dental patient. Offered spring semesters.

Clinical Management Concepts

Professor: Thomas V. Gardner
Associate professor: Lawrence C. Peterson
Assistant professor: Gerald Scott

112:167 Introduction to Quality Assurance 2 s.h.
Weekly series of meetings and student activities providing an introduction to and clinical experience in patient management and quality assurance concepts; students manage coordination of treatment, patient relations, and issues of quality assurance for an assigned group of patients.

112:185 Clinical Admissions Emergency 1 s.h.
Clinical evaluation, diagnosis, and treatment of patients with dental emergencies; determination of patient's dental condition for referral to appropriate department for definitive treatment.

112:189 Advanced Topics in Quality Assurance **2 s.h.**
Quality assurance from viewpoint of practicing dentist, dental educator, dental epidemiologist, and court system; students analyze their senior dental practice in relation to quality assurance criteria; discussion of ethical and moral dilemma in relation to dental practice.

DENTAL HYGIENE

Chair: Pauline Brine
Associate professors: Pauline Brine, Nancy Sisty LePeau, Kay Mescher, Elizabeth Pelton, Nancy Thompson
Adjunct assistant professors: Gayle Collins, Jane Rowat
Undergraduate degree offered: B.S. in Dental Hygiene
Graduate degree offered: M.S. in Dental Hygiene

Undergraduate Program

Qualified by education and licensure, the dental hygienist applies knowledge of the basic, social, dental, and clinical sciences in providing services for the prevention and control of oral diseases.

The Bachelor of Science degree program in dental hygiene includes two years of general education followed by two years of specialized study. The curriculum is accredited by the Commission on Dental Accreditation of the American Dental Association. Program graduates are prepared to take the national, regional, and state dental hygiene licensure examinations required for dental hygiene practice.

Included in the General Education Requirements are courses in the basic and social sciences. These courses provide the student with educational preparation in disciplines relevant to specialized study in dental hygiene and associated medical and dental sciences.

Students take the specialized courses during the junior and senior years. In the junior year, students enroll in 60:2 Human Histology; 71:130 Intermediate Pharmacology; 92:104 Introduction to Periodontology; 82:104 Operative Dentistry Laboratory for Hygienists; 86:101 Introduction to Oral Pathology; 86:102 Oral Pathology for Dental Hygienists; 86:104 Dental Radiology for Dental Hygienists; 87:104 Anesthesia and Analgesia; 88:101 Dental Anatomy; and 88:102 Head and Neck Anatomy.

In addition, juniors learn the basic theory and clinical skills required for dental hygiene practice in 88:103 Dental Hygiene Core I and 88:104 Dental Hygiene Core II, which integrate content in socio-medical-dental sciences with the theory and practice of dental hygiene.

During the senior year, students advance their clinical skills in 88:105 Clinical Dental Hygiene. In 92:105 Advanced Periodontics for Dental Hygiene Students, each student is assigned to work with a graduate student in periodontics, performing procedures on adults who have active periodontal disease. This experience not only advances dental hygiene clinical skills, but provides both the hygiene and graduate dental students with a learning experience emphasizing the team approach.

Seniors receive additional clinical experience in 86:105 Clinical Dental Radiology for Dental Hygienists. Weekly lectures and seminars reinforce clinical learning in 88:106 Seminar: Dental Hygiene Concepts and Practice.

Senior students also are enrolled in 88:107 Practicum: Community Dental Hygiene; 88:108 Seminar: Community Dental Health; 7W:121 Designing and Developing Instructional Materials; 22S:101 Biostatistics; and 112:145 Introduction to Geriatric Dentistry.

Courses traditionally taught as isolated subject-oriented units, such as dental health education, public health, and epidemiology, are incorporated into an integrated core. Learning emphasis is on the relationship between the underlying theory and practical application of community dental health. Students discuss broad community health issues related to the provision of dental health care. Field experiences enable them to apply knowledge of human behavior, basic principles of communication and marketing, and educational and research techniques to the design, implementation, and evaluation of health care and educational programs.

Aging Studies Program

As part of their dental hygiene studies, students may participate in a multidisciplinary program in aging studies. The program provides supportive course work for students who want to develop specialization in gerontology. For further information, see "Aging Studies Program" in the College of Liberal Arts section of the *Catalog*.

Minors and Double Majors

Dental hygiene students have the opportunity to develop a minor in another field or to pursue a double major. Students who select this option should plan their course of study with their dental hygiene adviser in close cooperation with faculty from the minor or other major department.

Admission

High School Preparation

Specific high school courses required are four years of English; four years of one foreign language (preferably Spanish); at least three years of mathematics, including two years of high school algebra and one year of high school geometry; and one year each of biology and chemistry.

College Preparation

Eligibility for admission to the professional program in dental hygiene requires fulfillment of the General Education Requirements of the College of Liberal Arts and completion of the following dental hygiene prerequisites:

Four semester hours (8 for transfer students from two-year colleges) of zoology or general biology—37:1 Introductory Animal Biology;

Three semester hours of inorganic chemistry—4:7 General Chemistry I;

Three semester hours of organic chemistry, including biochemistry—4:8 General Chemistry II;

Four semester hours of microbiology—61:164 Microbiology;

Three semester hours of nutrition—17:41 Introductory Nutrition;

Three semester hours of psychology—31:1 Elementary Psychology;

Three semester hours of sociology—34:1 Introduction to Sociology Principles;

Four semester hours of anatomy—60:1 Principles of Human Anatomy;

Four semester hours of physiology—72:130 Human Physiology.

These prerequisites provide the educational basis for the dental hygiene course of study. In addition, students admitted to the professional program of study must complete certification in cardiopulmonary resuscitation (CPR) at the basic life support for health care providers level before they enter the program.

Completion of a bachelor's degree or an associate of arts degree from an Iowa Area Community College fulfills the General Education Requirements with the exception of the foreign language requirement. However, the completion of a two-year associate degree program in dental hygiene does not provide an appropriate background for transfer into the baccalaureate program at Iowa.

Students begin the professional program in dental hygiene only in the fall. Those enrolled in The University of Iowa College of Liberal Arts need submit only the dental hygiene application. Transfer students must submit both College of Liberal Arts and dental hygiene applications.

Although applications are accepted and processed throughout the academic year, it is recommended that students apply for dental hygiene admission by November 1 preceding the fall semester in which they wish to enter the program.

Graduate Program

The graduate program fulfills the need to prepare hygienists who contribute to the advancement of new knowledge in dental hygiene and who provide leadership in the profession. The graduate program also fulfills the need to prepare scholars in dental hygiene education. Therefore, graduate program goals emphasize the acquisition of advanced scientific knowledge in dental hygiene; the biological, social, and physical sciences; and basic knowledge of and experience in conducting research.

The curriculum design provides students with major concentration in advanced dental hygiene theory. In the social science area, students consider the implications of applied sociological, psychological, economic, cognitive, and environmental concepts related to oral health. Selected readings examine societal values, structural elements of dental care delivery systems in relation to individual, family, and community oral health outcomes.

Study in the educational field includes dental hygiene trends, with emphasis on dental hygiene education; elements of curricular design; and the theory and application of didactic, clinical, and practicum teaching in dental hygiene.

Approximately 14 semester hours are taken in assigned courses to acquire advanced knowledge in dental hygiene and 10 are taken in research methodology and thesis preparation and defense. The remaining 10 semester hours include electives in the biomedical and social sciences.

Elective course work related to the biomedical sciences may include microbiology, histology, biochemistry, oral pathology, periodontology, and anesthesiology.

Electives emphasizing the social, economic, and political aspects of health include epidemiology, medical sociology, health care organization and administration, and health economics.

Students also are encouraged to consider taking electives in higher education, such as educational measurement, theories of learning, and administration.

It is recommended that dental hygiene graduate students take the following courses.

88:201 Seminar: Dental Hygiene Literature Review	arr.
88:203 Research: Dental Hygiene	3 s.h.
88:205 Social Factors and Oral Health	4 s.h.
88:206 Clinical Dental Hygiene Education	2 s.h.
88:207 Selected Topics in Dental Hygiene Education	2 s.h.
111:212 Statistical Methods for Dental Research	3 s.h.
or	
7P:143 Introduction to Statistical Methods	3 s.h.
111:224 Research Design in Dentistry	2 s.h.

Although students may begin the 34-semester-hour program during the summer session or fall semester, enrollment at the beginning of the fall semester is preferred. Most students should expect to take two academic years to complete degree requirements.

Admission

Applicants for admission are subject to the general rules of the Graduate College. Departmental requirements include an acceptable score on the Graduate Record Examination (GRE) General Test and a 2.80 minimum undergraduate cumulative grade-point average. The undergraduate education of the applicant should include courses equivalent to those in the undergraduate dental hygiene major at The University of Iowa.

Candidates for admission must submit official transcripts of all undergraduate academic records, an application for admission, and Graduate Record Examination scores to the Office of Graduate Admissions, Calvin Hall. Since these materials must be received before the candidate's application can be processed, students are encouraged to submit materials as early as possible prior to the semester for which admission is desired. Application for admission and information on the Graduate Record Examination can be obtained from the Office of Graduate Admissions.

Facilities

University of Iowa dental hygiene majors receive their professional preparation in the University's modern Dental Science Building. This building is part of The University of Iowa Health Center complex, one of the nation's outstanding health science teaching, research, and patient care facilities.

Financial Aid

In addition to financial assistance available to University students, there is a limited number of scholarship awards and loans specifically for undergraduate dental hygiene students. These loans are based on assessment of students' academic records as well as financial need.

Financial support for graduate students is available through teaching assistantships and patient care services. Awards are based on students' academic record and potential contribution to the teaching and patient service goals of the program. Resident tuition is charged to out-of-state students who receive teaching assistantships or patient service awards. Low-interest-rate loans also are available through the department.

Excellent undergraduate and graduate scholarships are available for minority students who have outstanding academic records. For further information, see "Financial Aid" in the "College of Dentistry" section of the *Catalog*.

Courses

For Undergraduates

88:101 Dental Anatomy **2 s.h.**
Dental terminology, the morphological characteristics of teeth, their positional relationships and functional considerations; emphasis on the relationship of dental morphology to clinical dental hygiene practice.

88:102 Head and Neck Anatomy **1 s.h.**
Includes neuroanatomy; lectures.

88:103 Dental Hygiene Core I **7 s.h.**
Introduction to dental hygiene theory, clinical skills, and oral diseases; didactic and clinical experiences related to the assessment of patients' general and oral health and the provision of complete dental hygiene services; infectious disease control in the workplace.

88:104 Dental Hygiene Core II **5 s.h.**
Dental hygiene theory applied to preventive treatment planning and performance of intermediate clinical dental hygiene and oral disease control procedures.

88:105 Clinical Dental Hygiene **7 s.h.**
Practice of advanced dental hygiene procedures, with emphasis on providing comprehensive preventive and clinical services.

88:106 Seminar: Dental Hygiene Concepts and Practice **5 s.h.**
Review of current research and advances in preventive procedures; ethical, legal, and social responsibilities of health care providers; current and extended roles in dental hygiene practice.

88:107 Practicum: Community Dental Hygiene **7 s.h.**
Knowledge of dental health, dental care, and educational and research techniques applied in field experiences to design, implement, and evaluate health care and educational programs.

88:108 Seminar: Community Dental Health **4 s.h.**
Oral health of the public and factors that influence it, including need and demand for dental care, financing of dental care, provider and patient relationships, and active and passive disease intervention.

88:111 Independent Study **arr.**
Designed for students who plan to pursue additional study or to explore career interests in dental hygiene practice, education, research, or public health.

For Graduates

88:201 Seminar: Dental Hygiene Literature Review **arr.**
Analysis of dental hygiene literature on political, sociological, and educational factors influencing trends and current status of knowledge in the field of dental hygiene.

88:202 Evaluation of Dental Hygiene Research **3 s.h.**
Evaluation of research to determine whether it provides a knowledge base for dental hygiene practice; identification of research topic and available resources leads to selection of a thesis topic.

88:203 Research: Dental Hygiene **3 s.h.**
Literature review, selection of research topic, finalization of protocol design for master's thesis.

88:205 Social Factors and Oral Health **4 s.h.**
Evaluation of current research conducted on cultural, sociological, and psychological factors influencing oral hygiene and oral health care.

88:206 Clinical Dental Hygiene Education **2 s.h.**
Philosophy and objectives of clinical dental hygiene education; psychomotor skill teaching, scientific bases of clinical procedures, and evaluation techniques applied through observation and practice in a clinical setting.

88:207 Selected Topics in Dental Hygiene Education **2-3 s.h.**
Teaching strategies, instructional models, and curriculum design for dental hygiene education; emphasis on observation and practical experience in lecture and seminar teaching.

88:216 Thesis: Dental Hygiene **2-3 s.h.**

ENDODONTICS

Head: Richard E. Walton
Professor: Richard E. Walton
Professor emeritus: Arne M. Bjorndal
Associate professor: Lisa R. Wilcox
Assistant professor: Eric M. Rivera
Graduate degree offered: M.S. in Endodontics

Predoctoral Program

Course work and clinical experiences in endodontics are of vital importance in the overall education of a dental student.

Preclinical endodontics, taught during the sophomore year, includes both didactic and laboratory courses. In clinical endodontics, students study both normal and pathological conditions of the dental pulp and periapex, emphasizing the areas of prevention and diagnosis of pulpal and periapical disease. Students treat endodontic patients under direct supervision of faculty and staff.

Graduate Program

The graduate program offered by the Department of Endodontics is designed to prepare qualified dentists for the practice of endodontics and/or a career in dental education and research.

The department offers two types of graduate (post-D.D.S.) programs.

The Master of Science degree program requires a minimum of 60 semester hours of graduate work, including an original research project and thesis. Students follow a plan of study that equals a total of 60 semester hours.

The certificate program requires no formal thesis. Candidates are expected to write a scientific paper of publishable quality, based on original research.

The certificate program involves course study for up to 60 semester hours of credit. An individual plan of study is prepared for each student.

Both programs are for a minimum of two calendar years, and only full-time students are admitted. Completion of the program requires satisfactory performance in a comprehensive written and/or oral examination.

These programs satisfy the training requirements of eligibility of the American Board of Endodontics.

The specific goals of these programs are to allow dentists to develop their skills and acquire a broad knowledge of the specialty of endodontics for teaching and practice purposes; to gain sufficient knowledge and experience in the educational process so that they may function confidently as dental educators; to recognize the value of the pursuit of academic research; and to develop the ability to plan, conduct, and report the results of research investigations.

Applicants for the graduate programs in endodontics must be graduates of an accredited college of dentistry and must comply with the requirements for admission to the Graduate College of The University of Iowa.

The graduate program in endodontics begins July 1. Applications should be made no later than October 15 of the year prior to the anticipated starting date. Students who have met the requirements for admission to the Graduate College then must be accepted into the program by the faculty of the Department of Endodontics. A personal interview with the applicant may be requested.

Students in the program must maintain a grade-point average of 3.00 to receive a certificate or degree. Students who fall below this level are allowed one semester to attain it. The circumstances creating the deficiency receive careful consideration.

Students enrolled in the graduate program in endodontics may not involve themselves in private practice enterprises outside the college. A student who does so will be asked to obligate himself or herself exclusively either to the program or the practice.

Persons applying to the graduate program in endodontics must be able to support themselves financially for the time required to complete the program.

Courses

Predoctoral

83:140 Endodontics 2 s.h.
Basic principles, concepts, and technical procedures necessary for treatment of pulpal problems in human teeth; lectures, seminars, and laboratory projects.

83:160 Clinical Endodontic Practice arr.
Clinical experience in the diagnosis and treatment of routine pulpal and periapical pathology; emergency diagnosis and treatment of patients by students under faculty supervision.

83:165 Clinical Endodontic Seminar 1 s.h.
Tooth pain, anesthesia, pulpal and periapical reactions, endodontic radiologic interpretation, trauma diagnosis and treatment, surgical endodontics, and endodontic implants; lectures, seminars.

Graduate

83:200 Update in Endodontics 1 s.h.
Recent advances in endodontic diagnosis, treatment planning, and clinical techniques; for endodontic residents.

83:225 Endodontic Literature Review I 2 s.h.
Past and present literature in endodontics; weekly topical reviews extend over two years; acquaints graduate students with current research knowledge.

83:226 Endodontic Literature Review II 2-3 s.h.
Continuation of 83:225.

83:227 Endodontic Literature Review III 2 s.h.
Continuation of 83:226.

83:228 Endodontic Literature Review IV 2 s.h.
Continuation of 83:227.

83:230 Research in Endodontics arr.
Topic selection; protocol preparation and starting investigation; completed research investigation and gathering of data; and writing of thesis and defense.

83:231 Thesis Preparation in Endodontics 3 s.h.

83:240 Endodontics Surgery Conference 2 s.h.
Evaluation of endodontic cases that require surgical treatment; discussion of different treatment methods and photographics; graduate students present their surgery cases before and after treatment to the faculty; discussion of surgical approach to endodontic treatment.

83:241 Advanced Clinical Endodontics arr.
Clinical treatment of patients, progressing from simple to more advanced, finally to implants, replants, transplants, all apical surgeries, root amputations, and hemisections.

83:250 Seminar in Endodontics I 1-2 s.h.
Review of pulp biology, histochemistry of tooth and hard structure; anatomy and physiology of supporting structures; basic philosophy and concept of endodontics; review of basic endodontic techniques.

83:251 Seminar in Endodontics II 1-2 s.h.
Biological concepts of pulpal and periapical pathology, with emphasis on inflammatory and immunologic responses; review of oral pathology emphasizing bony lesions.

83:252 Seminar in Endodontics III 1-2 s.h.
Clinical endodontic procedures and how they relate to difficult endodontic cases; evaluation of success and failure of endodontic cases in relation to treatment procedures followed; surgical endodontics, concepts, techniques.

83:253 Seminar in Endodontics IV 1-2 s.h.
All areas of dental treatment related to endodontics; complex endodontic cases and difficult patient conditions; relationship of endodontics to other dental specialties; dental practice management.

83:255 Practice Teaching in Endodontics arr.
Students present didactic material in lecture and seminar formats and do practice teaching in undergraduate clinics; for students interested in teaching dentistry, especially endodontics.

FAMILY DENTISTRY

Head: Daniel L. Hall
Professors: John V. Doering, Daniel L. Hall, Charles Sabiston, Jr., Gene A. Zach
Associate professors: Larry J. Crabb, James M. Leary, Vincent D. Williams
Assistant professor: Ana Diaz-Arnold

Predoctoral Program

The Department of Family Dentistry is responsible for senior dental students' final synthesis of academic experiences. The major goal is the integration of previously learned clinical skills into a well-organized and systematic approach to the comprehensive dental treatment of patients. The experience encompasses approximately three-fourths of the senior year.

Students spend five days a week in a clinical setting, where they gain experience in total patient management and care. Their didactic course work builds on their previous education. All areas of clinical and didactic instruction, patient awareness, and sensitivity to patients' needs are stressed.

The department's two practice management courses—one lecture, the other clinical—prepare students to make practice location selections as well as manage the business aspects of a dental office.

Advanced Education in General Dentistry

The Department of Family Dentistry sponsors a postgraduate Advanced Education in General Dentistry Program (AEGD) to improve and refine residents' skills and knowledge in the practice of general dentistry and to develop general practitioners who can plan and deliver high-quality dental services. AEGD practitioners are better able to plan and coordinate complete treatment for patients and to act as principal coordinators when specialists' services are necessary.

Residents are exposed to a broad range of clinical experiences while delivering

comprehensive care to an assigned group of patients, who are treated solely by the residents. They have the opportunity to discuss treatment planning, progress, and outcome with other residents and faculty. They also are involved with financial management, auxiliary management, and appointment planning, thus adding to their practice management skills.

Approximately 85 percent of the program consists of general dental practice. Each resident has responsibility for a group of patients. Patient assignments are made to assure broad experience in type and complexity of treatment needs. The didactic portion constitutes approximately 15 percent of the total experience and consists of seminars by discipline-trained faculty in all specialty areas. Dental emergency responsibilities are included in the program, as are pretreatment, midtreatment, and posttreatment case presentations. Journal clubs help the resident become familiar with the current literature and research.

The AEGD program lasts one year and carries a stipend.

Applicants for the program must be graduates of accredited U.S. or Canadian dental schools. Further information is available from the Department of Family Dentistry. Applications should be received no later than October 15 of each year.

Courses

Predoctoral

114:184 Advanced DAU **1 s.h.**
Clinical opportunity to assess the entire concept of delivering comprehensive dental treatment, using skills of a chairside dental assistant; small-group seminars, individual clinical coaching, self-instruction via a manual and supplemental media; topics include instrument transfer techniques, operator positioning, gaining access and visibility, work simplification and motion economy, management skills, interpersonal skills, and selection of dental equipment for four-handed dentistry.

114:185 Practice Management Lecture **1 s.h.**
Dynamic aspects of managerial principles, personnel management, economics of dental practice, leadership styles, marketing and communication, computerization, decision making, time utilization, with discussion of developing a dental practice; designed to promote students' ability to operate a dental practice effectively and efficiently.

114:186 Clinical Practice Management **2 s.h.**
Application of the principles of dental office management in a clinical environment of multiple auxiliaries and dental facilities; emphasis on the importance of efficiency and organization in delivering high-quality care to patients.

114:187 Family Dentistry Clinic I **arr.**
Treatment of patient's total dental needs in the Family Dentistry Clinic; incorporates previously acquired knowledge and experience for an integrated and comprehensive system of dental health care management.

114:188 Family Dentistry Clinic II **arr.**
Clinical experience in diagnosis, treatment planning, and treatment incorporating an integrated and comprehensive system of dental health care management.

114:192 Family Dentistry Lectures **1 s.h.**
Synthesis, analysis, and evaluation of previously acquired knowledge and experience for an integrated and comprehensive system of dental health care management.

114:193 Group Practice Seminar **1 s.h.**
Discussion of treatment progress of dental patients assigned to a group practice; methods are explored and developed to encourage the effectiveness and efficiency of total patient treatment by members of the group.

114:194 Specialties in General Practice **1 s.h.**
Lecturers from dental specialties discuss current techniques and findings in their areas, and applications for the general practitioner, and information about selection of graduate specialty programs.

114:195 Diagnosis and Treatment Planning Seminar **1 s.h.**
Students present documentation of diagnostic procedures used in developing a treatment plan and sequence for selected clinical patients; seminar atmosphere challenges students to defend findings and recommendations.

HOSPITAL FAMILY DENTISTRY

Head: Robert A.J. Olson
Division directors: Arthur Nowak (Pediatric Dentistry), Robert A.J. Olson (Oral and Maxillofacial Surgery), David O. Moline (Family Dentistry)
Director of general dentistry residency program: David O. Moline
Professors: John C. Casko, John V. Doering, Clement A. Full, Thomas V. Gardner, Stephen J. Goepferd, Daniel L. Hall, Leslie H. Higa, Philip A. Lainson, William E. LaVelle, Gilbert E. Lilly, James A. McLeran, John C. Montgomery, Arthur J. Nowak, William H. Olin, James R. Pinkham, William C. Rubright, Axel Ruprecht, Stephen D. Vincent, Jerry D. Walker, Richard Walton, Gene A. Zach
Associate professors: Stephen A. Aquilino, Paul J. Collins, Benny H. Hawkins, David O. Moline, Robert A.J. Olson, Sherwood Wolfson, Deborah L. Zeitler
Assistant professors: Michael J. Buckley, Kirk L. Fridrich, Gerard F. Koorbusch, Eric L. Rivera, Gerald L. Scott, Lisa R. Wilcox

The organizational structure of The University of Iowa Hospitals and Clinics includes a hospital dentistry clinical service with divisions of oral and maxillofacial surgery, family dentistry, and pediatric dentistry. There is specialty interaction from the departments of orthodontics, periodontics, endodontics, diagnosis, oral pathology, prosthodontics, and craniofacial anomalies within the family dentistry division. A one-year general practice residency is conducted under the auspices of that division.

Residency Program

The aim of the residency program in general practice is to provide preparation for a broader scope of private practice in the area of general dentistry. The program is designed to combine clinical and didactic training on an individual basis and to meet fundamental requirements of the Commission on Dental Accreditation of the American Dental Association.

The residency period covers one year of hospital-based training designed to provide clinical, didactic, and hospital experience at the postdoctoral level. Instruction and experience provided in the program prepare residents to meet the oral health needs of a wide range of ambulatory and nonambulatory patients.

Residency training includes use of hospital resources, management of ambulatory patients, inpatients, same-day surgery patients, and emergency medical and dental patients. Residents participate in consultations with other hospital services and are assigned to appropriate hospital services to fulfill the objectives of the training program. They also are appointed to the house staff of the hospital and have the same privileges and responsibilities as residents in other professional education programs.

Applicants must be graduates of an accredited college of dentistry and must be licensed to practice dentistry in the United States.

Applicants are selected via a matching program sponsored by the American Association of Oral and Maxillofacial Surgeons. Application deadline is September 1 for admission on July 1 of the next year. Applicants are appointed after the results of the match have been received and the staff takes official action.

OPERATIVE DENTISTRY

Head: John W. Reinhardt
Professors: Daniel Boyer, Kai Chiu Chan, Gerald Denehy, James Fuller, Wallace Johnson, Satish Khera
Professors emeriti: Devore Killip, James Wick
Associate professors: C. Frederick Erbe, John Reinhardt, Thomas Schulein
Assistant professor: Edward Swift, Jr.
Adjunct assistant professor: Paul Martin
Adjunct instructor: Jean Lesch
Graduate degree offered: M.S. in Operative Dentistry

Predoctoral Program

Course work and clinical experiences in operative dentistry are fundamental to the overall education of a dental student. The operative dentistry curriculum is designed so that the didactic material presented relates closely to the laboratory and clinical experiences. The program provides students with the knowledge and experience necessary to proceed independently in operative dentistry during the fourth year of training.

Graduate Program

The Department of Operative Dentistry offers a program of advanced training designed to prepare dentists for teaching, research, and practice. Since operative dentistry is not a specialty area of dentistry, there is ample opportunity in the graduate program for students to pursue courses that are of particular interest to them. They may study for either a Master of Science degree or a certificate in operative dentistry.

Requirements for the M.S. degree include satisfactory completion of 48 semester hours of specified graduate-level courses; preparation of an acceptable thesis based on original research; and formal defense of

the thesis and examination of the candidate by an examining committee.

Students should plan to furnish their own financial support for the research and thesis.

Applicants for the program must be graduates of recognized schools of dentistry and must comply with the admission requirements of the Graduate College. An interview with the applicant may be requested.

Courses

Dental Hygiene

82:104 Operative Dentistry Laboratory for Hygienists **2 s.h.**
Restorative dentistry and dental materials; composition, properties, manipulation, and uses of basic restorative materials of operative dentistry; lectures and laboratory projects.

Predoctoral

82:120 Dental Anatomy Didactic **1 s.h.**
Self-paced readings in dental nomenclature; detailed anatomy, eruption patterns of human primary and permanent dentition.

82:121 Dental Anatomy Laboratory **3 s.h.**
Detailed human tooth morphology and function using wax replacement method, restorative materials, plastic teeth.

82:122 Operative Dentistry I **2 s.h.**
Dental nomenclature; principles and design of cavity preparation; manipulation and placement of restorative materials; use of instruments in procedures pertaining to operative dentistry; lectures, readings.

82:123 Operative Dentistry I: Laboratory and Clinic **2 s.h.**
Study and application of procedures involved in preparing human teeth to receive dental restorations; students prepare different classes of cavities in plastic and natural teeth and use dental materials in fabrication of restorations.

82:140 Operative Dentistry II **1 s.h.**
Principles and design of cavity preparations, restoration of teeth, patient management, pain control, and other aspects of clinical practice; lectures, seminars.

82:141 Operative Dentistry II Clinic **3 s.h.**
Procedures in operative dentistry performed on patients in operative clinic; based on biological principles for preparing cavities and restoring with appropriate restorative materials; clinical course.

82:160 Operative Dentistry III Clinic **arr.**
Supervised patient treatment by students using amalgam, composite resin, and gold; emphasis on physiological and esthetic importance of restorative treatment.

82:165 Operative Dentistry III Seminar **1 s.h.**
Clinical problems, restorative dental materials, and treatment methods. For third-year students.

Graduate

Discipline Studies

82:224 Graduate Restorative Materials **2 s.h.**
Dental materials science: composition and properties of dental alloys, polymers, and ceramics. Same as 84:224.

82:225 Operative Dentistry Seminar I **1 s.h.**
Review and update of basic operative dentistry concepts of cavity preparation and material placement.

82:226 Operative Dentistry Seminar II **1 s.h.**
Direct resin systems and bonding technology and their utilization in dental esthetic treatment.

82:227 Operative Dentistry Seminar III **1 s.h.**
Use of porcelain in conventional and bonded esthetic restorations.

82:228 Operative Dentistry Seminar IV **1 s.h.**
Educational principles necessary to development of the health professions educator.

Research Program

82:230 Operative Dentistry Research I **3 s.h.**
Topic selection, committee selection, and literature review for thesis project.

82:231 Operative Dentistry Research II **2 s.h.**
Protocol completion and research conducted for thesis project.

82:232 Operative Dentistry Research III **3 s.h.**
Research completion, data gathering, and writing of thesis.

82:233 Operative Dentistry Research IV **3 s.h.**
Thesis completion and defense.

82:234 Selected Applications of Operative Dentistry **arr.**
Individualized overview of advanced operative dentistry techniques.

82:236 Biomaterials Research Methodology **1 s.h.**
Overview of dental materials research; instrumentation available for materials research; lectures, demonstrations. Same as 84:236.

Clinical Studies

82:240 Operative Dentistry Advanced Clinic I **arr.**
Operative materials and techniques; with restoration procedures assigned on a manikin.

82:241 Operative Dentistry Advanced Clinic II **arr.**
Treatment of patient cases in the operative clinic; emphasis on basic operative procedures.

82:242 Operative Dentistry Advanced Clinic III **arr.**
Treatment of patient cases in the operative clinic; emphasis on direct-bonded esthetic restorative procedures.

82:243 Operative Dentistry Advanced Clinic IV **arr.**
Treatment of patient cases in the operative clinic; advanced cast gold or esthetic restorative procedures.

82:244 Operative Dentistry Advanced Clinic V **arr.**
Treatment of patient cases in the operative clinic; advanced cast gold or esthetic restorative procedures.

82:245 Clinical Demonstrating **arr.**
Experience with undergraduate dental student teaching in laboratory and clinical situations.

ORAL PATHOLOGY AND DIAGNOSIS

Head: Gilbert E. Lilly
Professors: Harold L. Hammond, Gilbert E. Lilly, Axel Ruprecht, Christopher A. Squier
Professor emeritus: Alton K. Fisher
Associate professors: Michael W. Finkelstein, Pete Fotos, William J. Hausler, Steven D. Vincent
Associate professor emeritus: Philip S. Horton
Assistant professor: David Drake
Assistant professor emeritus: Francis H. Sippy
Adjunct associate professors: Eva Dahl, George C. Kienzle, Thomas P. Williams
Adjunct assistant professor: George Hanna
Assistant in instruction: Patty Morgando
Graduate degree offered: M.S. in Stomatology

Predoctoral Program

The department teaches dental and other health care students about diseases that manifest in and about the oral cavity. Students learn about the clinical, radiographic, laboratory, histopathologic, and therapeutic features of these diseases as well as their etiology and natural history. They also study identification of systemic diseases through physical evaluation of patients; the influence of systemic disease on dental therapy; and the influence of dental therapy on systemic diseases and abnormalities.

Graduate Programs

Master of Science

Stomatology is the science of structure, function, and disease of the oral cavity. Study methods include examination of related histories, evaluation of clinical signs and symptoms, and use of biochemical, microscopic, and radiologic procedures to establish a diagnosis and a plan for therapeutic management.

The department's faculty is responsible for predoctoral and postdoctoral education programs. The postdoctoral programs are diverse and flexible, emphasizing oral pathology or oral and maxillofacial radiology. Two educational tracks, one emphasizing oral pathology and the other oral and maxillofacial radiology, allow postdoctoral students to obtain advanced clinical, didactic, and research-related education while pursuing a Master of Science degree.

Master of Science in Stomatology with Oral Pathology Emphasis

This program for dental school graduates involves comprehensive study of basic biologic and health sciences in preparation for teaching and research. A minimum of 37 semester hours of satisfactory graduate credit is required. Candidates for the M.S. degree prepare and submit a thesis based on the results of research conducted during their course of study.

Certificate in Oral Pathology and Master of Science in Stomatology with Oral Pathology Emphasis

The minimum requirements of the certificate and master's degree programs are combined here. Completion time is usually 36 to 48 months. The educational requirements of the certificate program in oral pathology meet the requirements for the preparation of dental specialists as set forth by the Council on Dental Education of the American Dental Association and the American Board of Oral Pathology.

Master of Science in Stomatology with Oral and Maxillofacial Radiology Emphasis

This program for dental school graduates involves comprehensive study of basic and health sciences in preparation for teaching and research. A minimum of 46 semester hours of satisfactory graduate credit is required. Candidates for the M.S. degree

prepare and submit a thesis based on the results of research conducted during their course of study.

Certificate in Oral and Maxillofacial Radiology and M.S. in Stomatology with Oral and Maxillofacial Radiology Emphasis

The minimum requirements of the certificate and master's degree programs are combined. Completion time is usually 36 to 48 months. The educational requirements of the certificate program in oral and maxillofacial radiology meet the requirements for preparation of dental specialists as set forth by the American Board of Oral and Maxillofacial Radiology.

Program of Study

Students in all four programs must complete the core courses listed below. They also must complete the basic science and departmental courses appropriate to their track, listed as "additional required courses."

Facilities

The spaces reserved exclusively for the Department of Oral Pathology and Diagnosis include a radiology special procedures area, interpretation room, seminar room, tutorial laboratory for training small groups of graduate and undergraduate students, computer simulations area, surgical pathology laboratory, and a clinical pathology laboratory with areas for histopathology, hematology, and clinical chemistry.

In addition, the College of Dentistry has joint-use research laboratories that are well-equipped and staffed for conducting research involving histology, histochemistry, materials technology, radiobiology, ultrastructure, and electron probe analysis and quantification.

Admission

Applicants must have successfully completed an accredited program leading to the D.D.S. or D.M.D. degree, or a foreign equivalent, and must qualify for admission to The University of Iowa Graduate College. To be considered for admission, applicants must have a cumulative grade-point average of 2.70 on a 4.00 scale.

All applicants must take the Graduate Record Examination (GRE) General Test.

Students from countries where English is not the primary language must present evidence of satisfactory performance on the Test of English as a Foreign Language (TOEFL) and the Test of Spoken English (TSE).

Final decisions on acceptance of applicants who meet the requirements for admission rests with the department faculty. A personal interview may be requested.

Courses

Dental Hygiene

86:101 Introduction to Oral Pathology 1 s.h.
Emphasis on basic processes of disease and involvement of these processes in presentation of clinical disease.

86:102 Oral Pathology for Dental Hygienists 3 s.h.
Study of oral disease; basic information required to differentiate between normal and diseased oral tissues; general understanding of pathologic processes.

86:104 Dental Radiology for Dental Hygienists 1 s.h.
Intraoral techniques, radiation safety, processing and mounting radiographs; first-level course.

86:105 Clinical Dental Radiology for Dental Hygienists 2 s.h.
Supervised clinical experience in taking dental radiographs, processing and mounting films; second-level course.

Predoctoral

86:120 Introduction to Diagnosis and Oral Radiology 1 s.h.
Methods of clinical and radiographic examination and record keeping; correlation of basic and clinical sciences.

86:135 Oral Pathology 4 s.h.
Diseases involving orofacial organs; second-level course.

86:145 Preclinical Diagnosis and Oral Radiology 1 s.h.
Fundamental principles and techniques in diagnosis, radiology, and clinical pathology required for clinical practice; second-level course.

86:155 Systemic Disease Manifestations 1 s.h.
Clinical medicine for dental students; basic information required for evaluation of patients.

86:160 Clinical Oral Pathology and Diagnosis arr.
Diagnosis of orofacial diseases by clinical, laboratory, and radiographic methods; clinical case analysis format; third-level course.

86:161 Clinical Oral Radiology arr.
Supervised experience in taking and processing intraoral and extraoral radiographs; principles of radiographic interpretation; third-level course.

Graduate

86:200 Oral Pathology Literature Review arr.
New literature from a variety of health care journals.

86:225 Manifestations of Oral and Paraoral Disease arr.
Clinical experience in diagnosing and managing patients referred to the department.

86:226 Physical, Laboratory, and Historical Features of Disease arr.
Head and neck diseases and abnormalities; clinical pathology conference.

86:227 Surgical Oral Pathology 1 s.h.
Practical experience in day-to-day operations of the surgical oral pathology laboratory and advanced training in histopathologic diagnosis of oral and maxillofacial diseases. May be repeated. Consent of instructor required. Pre- or corequisite: 86:240.

86:228 Introduction to Surgical Oral Pathology 1 s.h.
Exposure to day-to-day operations of the surgical oral pathology laboratory and histopathologic diagnosis of oral and maxillofacial diseases. May be repeated. Consent of instructor required.

86:230 Research in Oral Pathology and Diagnosis arr.
Includes thesis preparation.

86:238 Introduction to Histopathology 1 s.h.
Case studies involving histopathologic diagnosis of diseases that affect the oral and maxillofacial region. May be repeated. Consent of instructor required.

86:240 Histopathology 1 s.h.
Case studies providing advanced training in histopathologic diagnosis of diseases that affect the oral and maxillofacial region. May be repeated. Consent of instructor required. Pre- or corequisite: 89:202.

86:241 Hospital Oral Pathology arr.
Management of patient consultations, diagnosis, and therapy at a hospital-based dental service.

86:242 Clinical Oral and Maxillofacial Radiology arr.
Radiologic manifestations of diseases; emphasis on manifestations in the craniofacial complex.

86:243 Practical Oral and Maxillofacial Radiology arr.
Active participation in the oral and maxillofacial radiology clinic; supervision of dental and dental hygiene students, and review of their cases; participation in clinical radiology conferences and laboratory exercises.

86:244 Technical Oral and Maxillofacial Radiology arr.
Hands-on experience with technical maintenance of darkroom and clinical equipment; troubleshooting under supervision of the radiology staff.

86:245 Head and Neck Radiology arr.
Hospital-based rotation in diagnostic radiology with participation in interpretation sessions under the supervision of the head and neck radiologist; sessions on CT, MRI, nuclear medicine, ultrasound.

86:256 Advanced Oral Pathology arr.
Diseases involving orofacial organs; content can be adapted to special interests of students; emphasis on bibliographic research, biodynamic analysis of pathologic processes, diagnostic interpretation. Consent of instructor required.

ORAL AND MAXILLOFACIAL SURGERY

Head: Robert A.J. Olson
Director of graduate studies: Deborah L. Zeitler (Oral and Maxillofacial Surgery)
Director of predoctoral studies: Gerard F. Koorbusch
Professors: Leslie H. Higa, James H. McLeran, John C. Montgomery
Associate professors: John C. Keller, Robert A.J. Olson, Sherwood Wolfson, Deborah L. Zeitler
Assistant professors: Karen A. Baker, Michael J. Buckley, Kirk L. Fridrich, Gerard F. Koorbusch
Graduate degree offered: M.S. in Oral and Maxillofacial Surgery

The Department of Oral and Maxillofacial Surgery combines clinical and didactic training on an individual basis to fit the interests, abilities, and development of students. Its predoctoral program is based in the College of Dentistry, with some clinical assignments in the division of oral and maxillofacial surgery at The University of Iowa Hospitals and Clinics. Graduate study is based primarily in the residency training program at The University of Iowa Hospitals and Clinics.

Predoctoral Program

The predoctoral curriculum is designed to develop a foundation of professional knowledge, coupled with known surgical skills, to enable students to diagnose and manage surgical problems related to the practice of general dentistry. Emphasis is placed on reinforcing high ethical standards and developing good surgical concepts, clearly indicating the moral responsibility assumed for the surgical problems undertaken.

The clinical portion of the curriculum allows students to develop surgical skills and apply the theoretical knowledge acquired in the didactic courses. The theory and application of anesthesia-analgesia, intravenous sedation, and nitrous oxide analgesia techniques are presented through didactic and clinical experiences.

Graduate Programs

Residency Program

The residency program in oral and maxillofacial surgery provides preparation for specialty practice. It is designed to combine clinical and didactic training on an individual basis. Every effort is made to adapt the program to the interests, abilities, and development of individual students; however, it is essential that students meet certain fundamental requirements.

The recommendations of the Council on Dental Education of the American Dental Association, the Committee on Graduate Training of the American Society of Oral and Maxillofacial Surgeons, and the American Board of Oral and Maxillofacial Surgery have been carefully considered in planning the structure and scope of training.

The residency period covers four years of hospital training, providing an orientation to hospital procedures, integration of basic and clinical sciences, acquisition of the principles of surgery, and familiarization with the various aspects of health services.

Competence in clinical oral and maxillofacial surgery requires knowledge of the basic medical sciences related to the specialty. Therefore, in addition to hospital and clinical training, residents take advanced course work in subjects such as applied pharmacology, surgical anatomy, pathology, physiology, and microbiology. They also review closely related disciplines such as roentgenology, anesthesiology, physical diagnosis, and laboratory procedures.

The assumption of increased responsibility and the opportunity for clinical and operating room experience are important aspects of residency training.

Residents gain clinical training in anesthesiology through an assigned rotation in the Department of Anesthesiology. Previous advanced training in physical diagnosis, physiology, pharmacology, and pathology assume greater clinical significance, and increased responsibility in the operating room as first assistant and surgeon further develops surgical judgment and skills.

Development and implementation of a research project under staff supervision enhance the value of the residency training.

Senior residents may be given responsibility for major oral and maxillofacial surgical cases during rotations at The University of Iowa Hospitals and Clinics and at Veterans Affairs Medical Center. Each third-year resident is assigned on a rotation basis as a clinical and didactic coordinator, and assumes responsibility to qualify for examination by the American Board of Oral and Maxillofacial Surgery.

Master of Science

Requirements for the Master of Science degree may be completed during residency. The M.S. program is a four-year course of integrated didactic and clinical study, including a research project and the preparation of a thesis.

Admission

Students may begin the full four-year program only on July 1. The application deadline in oral and maxillofacial surgery is September 1 for admission on July 1 of the next year.

Applicants must take the Graduate Record Examination (GRE) General Test, must be a graduate of an accredited college of dentistry and be licensed to practice dentistry in the United States, and should be in the upper one-third of their graduating class.

Documents required include application for graduate oral and maxillofacial surgery; an applicant appraisal form from the applicant's references; transcripts; and letters of recommendation from the dean of the dental college from which the applicant graduated and from two professional references.

Interviews are not required but are strongly recommended.

Applicants are selected via a matching program sponsored by the American Association of Oral and Maxillofacial Surgeons. Appointments are made after the match results are revealed and the staff elects to take official action. All appointments should be tendered on or before February 1 prior to the July 1 effective date.

The Office of Graduate Admissions sends admission forms to applicants. The forms must be completed for the Graduate College approximately by March 1.

Facilities

The University of Iowa Health Center has outstanding basic and clinical science departments that stimulate and support scholarly research and superior clinical practice. The facilities of The University of Iowa Hospitals and Clinics, the Veterans Affairs Medical Center, and the Colleges of Dentistry and Medicine provide an appropriate environment for residency training in oral and maxillofacial surgery.

Courses

Dental Hygiene

87:104 Anesthesia and Analgesia **1 s.h.**
Principles and techniques in use of local anesthesia; practical application of local anesthesia techniques for dental hygiene students.

Predoctoral

87:115 Anesthesia and Pain Control I **1 s.h.**
Principles and techniques of complete medical history, head and neck examination, cardiovascular and respiratory examination; neuroanatomical and psychophysiological aspects of pain; pharmacologic action of local anesthetics and techniques in the use of local anesthetics.

87:130 Basic Oral and Maxillofacial Surgery **2 s.h.**
Basic principles of oral surgery; indications and contraindications for extractions; evaluation of patient's related medical history; techniques of extraction and minor oral surgery procedures.

87:145 Anesthesia and Pain Control II **1 s.h.**
Theory and application of nitrous oxide sedation; emphasis on cardiovascular and respiratory physiology; instrumentation of nitrous oxide sedation; evaluation of patients for nitrous oxide sedation, practical techniques of nitrous oxide sedation.

87:155 Advanced Oral and Maxillofacial Surgery **1 s.h.**
History, examination, diagnosis, and treatment of diseases and traumatic injuries of the oral cavity.

87:160 Clinical Oral and Maxillofacial Surgery **arr.**
Clinical experience in oral surgery clinics of the College of Dentistry, The University of Iowa Hospitals and Clinics, and Veterans Affairs Medical Center.

Graduate

87:201 Hospital Procedures **1 s.h.**
Hospital rules and regulations, patient and department records, general information relative to hospitalized patients.

87:202 Basic Science Review **4 s.h.**
Head and neck anatomy with dissection, bacteriology, pathology; special lectures by medical and dental staff.

87:207 Surgical Anatomy **1 s.h.**
Head and neck structures found in major oral surgery procedures; special emphasis on maxillofacial problems and surgical emergencies; may include animal surgery.

87:208 Pain and Anxiety Control **1-3 s.h.**
Concepts of nitrous oxide, intravenous, oral, and intramuscular anxiety and pain control; pharmacology of various agents used; complications and their management.

87:209 Principles of Anesthesia **2 s.h.**
General anesthesia, study of agents and their effects on respiratory and cardiovascular systems; literature review.

87:211 Literature Seminars and Journal Club **1 s.h.**
Special attention to material covered in assigned journals.

87:212 Surgical Case Reports **1 s.h.**

87:214 Roentgen Interpretation **2 s.h.**
Review of theory and technique together with laboratory assignments.

87:215 Physical Diagnosis **2 s.h.**
Review of principles of physical diagnosis.

87:218 Oral Pathology Conference **1 s.h.**
Review and discussion of current clinical specimens.

87:225 Oral and Maxillofacial Surgery Seminar I **1 s.h.**
Readings, individual mini-lecture presentations; topics selected by students and faculty.

87:226 Oral and Maxillofacial Surgery Seminar II **1 s.h.**
Readings, individual mini-lecture presentations; topics selected by students and faculty.

87:227 Oral and Maxillofacial Surgery Seminar III 1 s.h.
Readings, individual mini-lecture presentations; topics selected by students and faculty.

87:230 Oral and Maxillofacial Surgery Research I 2 s.h.
Topic selection, review committee selection, literature review.

87:231 Oral and Maxillofacial Surgery Research II 3 s.h.
Students complete protocol and begin research program.

87:232 Oral and Maxillofacial Surgery Research III 3 s.h.
Thesis project; students complete research project and data gathering.

87:233 Oral and Maxillofacial Surgery Thesis 3 s.h.
Thesis and defense; comprehensive examination over three-year program.

87:240 Clinical Oral and Maxillofacial Surgery I arr.
Specialty and technical seminars and patient treatment; clinical practice on assigned patient problems.

87:241 Clinical Oral and Maxillofacial Surgery II arr.
Specialty and technical seminars and patient treatment; clinical practice on assigned patient problems.

ORTHODONTICS

Head: John S. Casko
Professors: Samir E. Bishara, Richard M. Jacobs, Charles R. Kremenak, Robert N. Staley
Graduate degree offered: M.S. in Orthodontics

Predoctoral Program

The purpose of the predoctoral program in orthodontics is to enable the general practitioner of dentistry to recognize, diagnose, and treat with competence simple malocclusions of the teeth.

Lecture courses guide the student in learning basic concepts of dental and facial growth, as well as treatment-oriented subject matter. In a laboratory course, diagnostic records are taken and evaluated and treatment appliances are fabricated. The department supervises a volunteer program for clinical treatment of selected patients.

Graduate Program

The purpose of the graduate program in orthodontics is to educate specialists capable of diagnosing and treating any malocclusion of the teeth requiring comprehensive care. The specialist should be familiar with and able to critically analyze biologic, biomechanic, diagnostic, and treatment concepts in orthodontics.

Satisfactory completion of a 23-month period of intensive study, including lecture courses, seminars, clinical practicum, and a research paper, qualifies students for the Certificate of Orthodontics. If students satisfactorily complete a thesis based on an original research project, they qualify for an M.S. degree in addition to the certificate.

Opportunities are available for research and independent study in the department.

Special facilities for research in biomechanics and craniofacial growth are available.

Interaction with other departments provides learning and research opportunities in surgical orthodontics, cleft lip and palate treatment, speech pathology, animal experimentation, and human growth.

Admission

Admission requires the D.D.S. degree or its equivalent, and satisfaction of Graduate College requirements.

The application deadline is October 1 for the class starting July 1. Applicants are required to come to the University for interviews with department faculty.

Courses

Predoctoral

89:115 Growth and Development 1 s.h.
Basic and introductory information about normal human growth and development, with emphasis on the craniofacial region.

89:130 Orthodontic Diagnosis and Its Biological Foundations 1 s.h.
Introduction to various concepts of craniofacial biology basic to orthodontics diagnosis and the philosophy of management of orthodontic problems; topics include development of dentition, physiology of the stomatognathic system, neurophysiological considerations, growth and development, genetic variability in the face and teeth, growth of the cranium and facial skeleton.

89:135 Orthodontic Laboratory 1 s.h.
Design and construction of orthodontic appliances; study of cast trimming.

89:136 Orthodontic Treatment 1 s.h.
Ranges from patient management to the use of appliances for correcting some malocclusions that the general practitioner can handle in the office.

89:145 Orthodontics in General Practice 1 s.h.
Case analysis used to develop ability to differentiate between simple and complex orthodontic problems; orthodontic classification, diagnosis, and treatment planning as a continuum underlying the process of systematic decision making in clinical practice.

89:170 Orthodontic Clinic arr.
Clinical experience in orthodontic diagnosis, treatment planning, and treatment; selected patients with malocclusions appropriate for undergraduate treatment; record taking; supervised diagnosis and treatment; students must follow patients from initial records to completion of treatment and must honor all obligations to patients, which may include appointments during summer months.

Graduate

89:200 Control Theory and Craniofacial Morphogenetic Systems 1 s.h.
Broadens students' general biological perspective, acquaints them with what is now variously called general system theory, control theory, cybernetics, systems analysis; develops students' perspective of role of applied human biologist; provides information about the status of human biology as a science.

89:201 Orthodontic Theory: Diagnosis and Treatment Plan 2 s.h.
Orthodontic diagnosis, treatment planning, and treatment; lecture and discussion.

89:202 Diagnosis and Treatment Planning 2 s.h.
Seminar readings concerning orthodontic diagnosis; treatment of particular kinds of orthodontic problems; students present case histories of patients treated in graduate clinic.

89:203 Advanced Orthodontic Technique arr.
Weaves theoretical ideas into manual skills that students must reproduce on typodont to have immediate recall of statically indeterminate problems encountered by the practitioner every day; not a technique course per se, but includes complete spectrum of principles underlying all techniques developed since 1900, in the context of modern materials.

89:204 Biomechanics arr.

89:205 Facial Growth 1-2 s.h.
Theories and processes related to the growth of the face; utilization of accepted concepts of facial growth in the treatment of individuals with various types of malocclusions during active growth period.

89:207 Case Analysis arr.
Seminar readings in diagnosis and treatment of mixed dentition patients; students present case histories of patients treated by serial extraction procedure.

89:209 Orthodontic Practicum arr.
Clinical practice at the chair.

89:210 Orthodontic Seminar arr.
Evaluation, discussion, criticism, defense of different diagnostic and treatment approaches to orthodontic cases that need, are undergoing, or have completed orthodontic treatment.

89:211 Problems: Orthodontics arr.

89:212 Research Orthodontics arr.

89:215 Orthodontic Journal Club arr.
Reading of current biological and technical publications; students critically evaluate articles and are encouraged to think critically about new knowledge and to accept or reject concepts by debating their points before the class.

89:216 Practice Management arr.
Business management of orthodontic practice; topics range from solo practice to associateship, partnership, practice corporation.

89:217 Cephalometrics arr.
Evaluation of skull X-ray (lateral and/or postero-anterior) as one of many adjuncts used in formulating orthodontic diagnosis and treatment plans for individuals with malocclusions; cephalometrics as a tool for research on craniofacial structures.

89:220 Craniofacial Anatomy arr.
Readings in anatomy, phylogeny, ontogenesis, and physiology of craniofacial structures of interest to orthodontists; seminar format.

89:221 Surgical-Orthodontic Seminar 1 s.h.
Joint surgical-orthodontic evaluation, discussion, criticism, and defense of different diagnostic and treatment approaches to orthodontic cases that need, are undergoing, or have completed surgical-orthodontic treatment.

89:229 Basic Orthodontics for the Pedodontist 2 s.h.
Basic orthodontic background for graduate pediatric dentistry residents; didactic and typodont components.

89:270 Orthodontic Clinic II 1 s.h.
Clinic experience in orthodontic diagnosis, treatment planning, and treatment; treatment of a limited number of patients with preventive and interceptive orthodontic problems appropriate for treatment by the pedodontic specialist; students must follow patients from initial records to completion of treatment.

PEDIATRIC DENTISTRY

Head: Jimmy R. Pinkham
Professors: Clemens A. Full, Stephen J. Goepferd, Arthur J. Nowak, Jimmy R. Pinkham, Jerry D. Walker, James S. Wefel
Adjunct clinical associate professor: Donald Conlon
Adjunct clinical assistant professors: David Blaha, Alex Brandtner, Keri Doyle, Rhys Jones, Michael J. Kanellis
Assistant in instruction: Catherine M. Skotowski
Graduate degrees offered: M.S. in Pediatric Dentistry; Certificate in Pediatric Dentistry

The Department of Pediatric Dentistry provides instruction for dental and graduate students in the prevention and treatment of dental diseases in children. Instruction combines didactic, laboratory, and clinical experiences and gives special consideration to reviewing current literature and managing dental problems of handicapped children. It also emphasizes efficient treatment through proper utilization of dental auxiliary personnel and record management.

Graduate Program

Graduate study in pediatric dentistry leads to both certification and a master's degree. The program gives special emphasis to preparation for certification by the American Board of Pediatric Dentistry. It is fully accredited by the Commission on Dental Education of the American Dental Association.

Students are trained in all phases of pediatric dentistry and have career choices in practice, education, or research.

Approximately 50 percent of the program is devoted to advanced clinical activity, 30 percent to didactic courses and practice teaching, and 20 percent to original research.

The program includes a core of didactic, clinical, and research-oriented courses supplemented by elective selections determined by students' individual interests.

Development of a minor subject area is recommended.

Close association with the Department of Pediatrics in the College of Medicine and with the University Hospital School and The University of Iowa Hospitals and Clinics permits emphasis on oral rehabilitation under general anesthesia, instruction in physical diagnosis, and management of developmentally disabled children.

Research Opportunities

Research carried out by faculty and graduate students in pediatric dentistry has been selected regularly for national awards and journal publications. Clinical and laboratory research projects are in progress, with financial support from federal agencies and other sources. Significant contributions have been made in the areas of cariology, dentistry for handicapped persons, fluoride therapy, and child behavior management.

Faculty

Faculty members hold numerous national and state offices, committee memberships, consultantships, and honors in professional organizations. They serve as reviewers for several professional journals and federal granting agencies. They also participate regularly in continuing education programs for dentists and other health science personnel. Five of the professors are diplomates of the American Board of Pediatric Dentistry.

Financial Aid

Stipend support is available to qualified students through a grant from the Office for Maternal and Child Health, Bureau of Community Health Services, Department of Health and Human Services.

Admission

Prospective students must apply to the Graduate College.

Courses

Predoctoral

90:140 Pediatric Dentistry Diagnosis and Treatment 2 s.h.
Concepts of growth and development, behavior management, and preventive-restorative techniques for pediatric patients.

90:160 Clinical Pediatric Dentistry arr.
Comprehensive clinical management of pediatric patients.

90:165 Clinical Seminar in Pediatric Dentistry 1 s.h.
Discussions of patient management, case histories, treatment philosophies, and other issues in contemporary dentistry for children.

Graduate

90:225 Advanced Didactic Pediatric Dentistry arr.
Twelve themes in pediatric dentistry, including growth and development, behavior management, preventive-restorative techniques, diseases.

90:230 Research in Pediatric Dentistry arr.
Research design and completion of an original research project, with results presented in publishable form.

90:231 Thesis Preparation arr.
Preparation of original research project and completion of thesis.

90:240 Advanced Clinical Pediatric Dentistry arr.
Comprehensive clinical management of pediatric patients in areas of preventive orthodontics, operative therapy, endodontia, and minor oral surgery.

90:241 Pediatric Physical Diagnosis for Dental Practice arr.
Principles and rationale for making a physical evaluation of the child.

90:242 Pediatric Therapy for Dental Practitioners arr.
Principles of therapy in various disease conditions.

90:245 General Anesthesia Rotation arr.
One-month rotation through the anesthesia service at The University of Iowa Hospitals and Clinics; emphasis on pediatric pharmacology and medicine.

90:250 Practice Teaching in Pediatric Dentistry arr.
Observations and practice in current teaching procedures.

90:270 Pediatric Dentistry Case Review arr.
Diagnostic and treatment plan approaches to pediatric dental patients, particularly those with growth and development problems.

PERIODONTICS

Head: Phillip A. Lainson
Professors: Frank J. Kohout, Phillip A. Lainson, William C. Rubright
Associate professors: Paul J. Collins, William R. Grigsby, Benny F. Hawkins
Assistant professor: James D. Spivey
Adjunct clinical assistant professors: Steven H. Cooper, Allen P. Kvidera
Assistant in instruction: Nancy A. Slach
Graduate degree offered: M.S. in Periodontology

Predoctoral Program

The Department of Periodontics is concerned with the diagnosis, treatment, and prevention of periodontal diseases. The predoctoral program combines didactic, laboratory, and clinical experience, with emphasis on applying the biological concepts of periodontology to the comprehensive clinical management of patients who have periodontal diseases.

Graduate Programs

Master of Science

The Master of Science program is designed to provide training for teaching, research, and specialization in periodontics. The program meets all requirements of the Commission on Dental Accreditation of the American Dental Association for advanced dental education programs in periodontics. It also meets eligibility requirements for certification by the American Board of Periodontology and complies with regulations of the Graduate College for programs of higher education in dentistry.

The program requires satisfactory completion of required and elective course work, preparation and defense of an acceptable thesis based on original research, and satisfactory completion of comprehensive written and oral examinations.

Completion of the program requires a minimum of 24 calendar months of full-time study.

Ad Hoc Interdisciplinary Ph.D. Program

Under Graduate College regulations, proposals for interdisciplinary doctoral programs of study may be developed. The Graduate College grants final approval of such individual programs. The Department of Periodontics assists in developing individual doctoral programs designed to train dentists for careers in teaching and research in periodontal diseases. The programs that include the Institutional Dental Scientist Program are interdisciplinary with the basic sciences.

Certification

The certification program provides a sound foundation for the clinical practice of periodontics and may be combined with the Ph.D. program. The program meets all requirements of the Commission on Dental Accreditation of the American Dental Association for advanced dental education programs in periodontics. It also meets

eligibility requirements for certification by the American Board of Periodontology.

Completion of the program requires 24 calendar months of full-time study, including satisfactory completion of required and elective courses, satisfactory completion of comprehensive written and oral examinations, and an acceptable literature review or research paper.

Opportunities are provided for experience in clinical and basic research.

Admission

Admission to graduate study in periodontics requires the D.D.S. degree or its equivalent, and satisfaction of Graduate College admission requirements. (See the "Graduate College" section of the *Catalog*.) National Dental Board Examination scores, if available, are required. Interviews are encouraged but not mandatory.

Facilities

The department has 20 modern, well-equipped operatories devoted exclusively to periodontics, and access to hospital experience in The University of Iowa Hospitals and Clinics and the Veterans Affairs Medical Center, both nearby. Research facilities include a departmental research laboratory and collegiate laboratories in histology, microscopy, biomaterials, quantitation, tissue culture, molecular biology and biochemistry, and microbiology as well as animal facilities. These collegiate facilities are in addition to those available by arrangement with The University of Iowa Hospitals and Clinics, Human Biology Research Facility, and medical laboratories; and the Veterans Affairs Medical Center.

Financial Aid

Applicants must be financially prepared to undertake uninterrupted studies. Assistantships and loans are offered, depending on available resources.

Courses

Dental Hygiene

92:104 Introduction to Periodontology **2 s.h.**
Fundamental concepts of periodontology for dental hygienists, presented in a lecture and seminar format augmented by slide series.

92:105 Advanced Periodontics for Dental Hygiene Students **2 s.h.**
Differential diagnosis, prevention of disease, mechanisms of destructive periodontal disease, maintenance of treated periodontium; seminars.

Predoctoral

92:140 Periodontic Methods I **1 s.h.**
The normal periodontium, gingivitis, periodontitis, diagnosis, prognosis, and treatment planning.

92:141 Periodontic Methods II **1 s.h.**
The initial phase of periodontal therapy, treatment of acute periodontal problems, curettage, gingivectomy, and periodontal flap procedures, including osseous considerations.

92:160 Periodontics **arr.**
Comprehensive clinical management of the periodontal patient.

92:165 Periodontology **1-2 s.h.**
Comprehensive concepts of periodontology and the clinical management of patients; lectures and seminars.

Graduate

92:201 Advanced Periodontology **arr.**
Comprehensive review of periodontal therapy; for incoming graduate students.

92:202 Clinical Seminar in Periodontics **arr.**
Comprehensive management of the periodontal patient, with emphasis on treatment planning and case documentation and presentation for complete dental therapy; conjoint dental science seminars.

92:205 Methods of Instruction in Periodontics **arr.**
Experience in course design in periodontics; behavioral objectives and methods of evaluation.

92:207 Practice Teaching in Periodontics **arr.**
Practical experience in lecturing, seminar direction, and clinical teaching in periodontics.

92:208 Recent Advances in Periodontics **arr.**

92:210 Periodontology Pathology Seminar **arr.**
Differential diagnosis and histopathology of oral lesions often encountered in clinical periodontal practice.

92:212 Applied Oral Microbiology **arr.**
Microbiology as it applies to oral health problems.

92:213 Biochemical Aspects of Periodontology **arr.**
Biochemical subjects relevant to periodontology (e.g., blood clotting, cell metabolism, nutrition).

92:225 Periodontology Literature Review I **1 s.h.**

92:226 Periodontology Literature Review II **1 s.h.**

92:227 Periodontology Literature Review III **1 s.h.**

92:228 Periodontology Literature Review IV **1 s.h.**

92:230 Research Periodontology **arr.**

92:231 Thesis Preparation in Periodontology **3 s.h.**
Preparation of original research project and completion of thesis.

92:240 Advanced Clinical Periodontics **arr.**
Comprehensive clinical management of the periodontal patient, with emphasis on the complex case.

PREVENTIVE AND COMMUNITY DENTISTRY

Head: Ronald J. Hunt
Professors: Ronald J. Hunt, Nelson S. Logan
Professors emeriti: Naham C. Cons, W. Philip Phair
Associate professors: Marsha Cunningham, Howard M. Field, Jed S. Hand, Steven M. Levy, Henrietta L. Logan, Derek H. Willard
Assistant professor: Aljernon J. Bolden
Clinical associate professor: Eugene W. Young
Clinical assistant professors: Howard J. Cowen, Peter P. Kambhu
Adjunct associate professors: Classie Hoyle, Hermine McLeran, Jamie Sharp
Graduate degree offered: M.S. in Dental Public Health

Predoctoral Program

Programs in preventive, community, and geriatric dentistry are designed to increase students' awareness of preventive dental practices, aspects of dental practices affected by community factors, and care of compromised adult patients.

Extramural programs provide students with opportunities to interact with health care teams and members of communities in Iowa. The department conducts off-site extramural programs throughout the state.

Using the community as the classroom, students are able to observe and participate in a variety of activities intended to make them aware of the societal obligations they must assume in order to practice effectively.

Graduate Program

The Master of Science degree program is designed to prepare students as specialists in dental public health. The program has a research emphasis and requires a research project culminating in the completion and defense of a thesis.

The program is designed to be completed in two academic years of full-time study and requires a minimum of 40 semester hours of course work. Successful graduates meet the educational requirements for eligibility for the certifying examination of the American Board of Dental Public Health.

Courses

Predoctoral

111:115 Introduction to Professional Responsibility and Values **1 s.h.**
Helps freshman students examine their values, consider the values of the dental profession, and relate their own values to those of the school and the profession.

111:116 Preventive Dentistry I **2 s.h.**
Introduction for first-year dental students; includes lectures, laboratory, small-group discussions, and clinical experiences; students identify health and disease in their own mouths and learn practical methods of disease control, philosophy of preventive dentistry; patient assessment and clinical diagnosis. Offered fall semesters.

111:117 Preventive Dentistry II **1 s.h.**
Multifactorial etiology of dental caries; support data for the use of fluorides, sealants, and plaque control mechanisms in control and prevention of caries; case-study approach. Offered spring semesters. Prerequisite: 111:116.

111:118 Preventive Dentistry III **2 s.h.**
Fundamental concepts and skills in instrumentation for detection and removal of calculus deposits; development of communication and patient management skills; prophylaxis and oral hygiene instruction for two collegiate recall patients. Offered in summer sessions. Prerequisite: 111:117.

111:145 Preventive Dentistry IV **2 s.h.**
Clinical program allows students to provide a complete prophylaxis-preventive service for collegiate patients; use of communication skills in a clinic setting; specific data concerning human nutrition, with emphasis on evaluation and counseling. Prerequisite: 111:118.

111:160 The Practice of Dentistry in the Community I **1-2 s.h.**
Dental public health, history of dentistry, dental personnel, organized dentistry, issues confronting the profession, evaluation of scientific literature reporting descriptive and experimental research. Offered fall semesters.

111:161 The Practice of Dentistry in the Community II **1-2 s.h.**
Factors that affect the profession and practice of dentistry: legal and malpractice issues, supply and demand, types and practice organization, financing and quality of care.

111:185 Broadlawns Medical Center arr.
Teams of five students provide dental care to low-income patients in a Des Moines metropolitan hospital-based clinic; students participate in community-related assignments and on-call assignments in the hospital and the emergency department; housing is provided.

111:186 Colorado Migrant Program arr.
Two students spend four weeks providing primary dental care and outreach services to a migrant population; provides broad understanding of needs of and resources for migrant and low-socioeconomic populations.

111:187 Community Health: Davenport arr.
Combination medical-dental ambulatory health care facility serving Scott County residents on a sliding fee scale; one dental student spends four weeks as part of the health care team in an eight-operatory dental clinic.

111:188 Linn County Dental Program arr.
Provides clinical and outreach services for children from low-income families at St. Luke's Hospital in Cedar Rapids; during a four-week rotation, students experience operative and behavioral dental problems, observe hospital protocol, and learn special needs of low-socioeconomic clients.

111:189 Special Care Program arr.
Students provide dental care to physically and medically compromised adult patients in the special care clinic, use portable dental equipment to care for nursing home residents, and observe hospital procedures and practices in clinics of University Hospitals.

111:191 Private Practice Preceptorship arr.
Students provide dental care under the supervision of a dentist-preceptor practicing in Iowa; various aspects of practice, including office management and community affairs.

111:192 Veterans Administration Medical Center: Iowa City arr.
Students observe hospital procedures and practices in hospital clinics and wards; dental care services are provided in the hospital dental clinic.

111:193 Veterans Administration Medical Center: Knoxville arr.
Two students spend four weeks in 900-bed neuropsychiatric and geriatric hospital providing dental care to inpatient and outpatient veterans; departments, such as physical therapy, rehabilitative medicine, and psychiatry; housing is provided.

111:194 Special Field Clinic arr.
Individually arranged extramural experiences; programs are developed according to student needs and extramural opportunities. Department approval of program required.

111:195 Hospital Externship arr.
Programs individually arranged with various hospitals, usually out-of-state; experience in alternate dental care delivery systems. Department approval of program required.

Graduate

111:200 Introduction to Dental Public Health 2 s.h.
Science, philosophy, and practice of dental public health.

111:202 Research Protocol Seminar 2 s.h.
Development of a master's thesis protocol; students identify a thesis topic, write a detailed review of the relevant literature, and outline potential research methods.

111:203 Independent Study: Dental Public Health arr.
Individual study in student's special interest area, which must be approved by faculty supervisor; study design, procedures, and results are reported in a paper.

111:204 Principles of Oral Epidemiology 3 s.h.
General principles of epidemiology, including retrospective, prospective, and cohort study designs; validity and reliability; distribution and determinants of oral diseases—caries, periodontal diseases, oral cancer, malocclusion, fluorosis, and HIV infection.

111:205 Administration of Public Dental Programs 2 s.h.
Application of general management concepts; includes practical aspects of planning, financing, staffing, implementing, operating, and evaluating dental public health programs at the federal, state, and local levels.

111:206 Preventive Programs in Dental Public Health 2 s.h.
Public health methods for preventing and controlling major dental conditions, primarily dental caries and periodontal disease; clinical efficacy and cost-effectiveness; students develop a comprehensive preventive oral health plan for a community.

111:207 Social Science in Dentistry 2 s.h.
Selected literature in the social and behavioral sciences as it applies to dentistry; critical analysis of research.

111:208 Field Experience in Dental Public Health arr.
Directed field experience of varying length, individually arranged with public and voluntary health agencies according to needs of students and agencies.

111:211 Thesis: Dental Public Health arr.
Protocol preparation; data collection, analysis, and organization; writing and defense of research.

111:212 Statistical Methods for Dental Research 3 s.h.
Descriptive methods, elementary probability, distributions, populations and samples, methods for analyzing percentage data and paired and unpaired measurement data, regression, and correlation and analysis of variance.

111:214 Financing Dental Care 2 s.h.
Mechanisms of payment for health care service providers, third-party prepayment plans, salaried and public-financed programs, Medicaid and Medicare programs, and national health insurance systems.

111:215 Introduction to Statistical Computing 2 s.h.
Use of statistical packages on a mainframe or personal computer for data management and analysis.

111:216 Teaching Practicum: Special Care/Geriatric Dentistry arr.
Introduction to philosophies of dental education, teaching methodologies, and evaluation, including present historical and current concepts; practical experiences from supervised clinical teaching in 111:189.

111:217 Teaching Practicum: Preventive Dentistry arr.
Introduction to philosophies of dental education, teaching methodologies, and evaluation, including historical and current concepts; practical experiences from supervised clinical teaching in 111:116, 111:118, or 111:145.

111:218 Teaching Practicum: Community Dentistry arr.
Introduction to philosophies of dental education, teaching methodologies, and evaluation, including historical and current concepts; practical experiences from supervised teaching in 111:160 or 111:161.

111:224 Research Design in Dentistry 2 s.h.
Types of studies used in dentistry; design validity; sampling methodologies; major descriptive and experimental designs used in dental research; application of statistical tests to these designs.

111:230 Geriatric Care I arr.
Diagnosis and management of geriatric dental health care problems, with emphasis on clinical dental treatment; case study approach; first of a four-course sequence.

111:231 Geriatric Care II arr.
Continuation of 111:230, which is prerequisite.

111:232 Geriatric Care III arr.
Continuation of 111:231, which is prerequisite.

111:233 Geriatric Care IV arr.
Continuation of 111:232, which is prerequisite.

PROSTHODONTICS

Head: Forrest R. Scandrett
Professors: Ronald L. Ettinger, William E. LaVelle, Forrest R. Scandrett, Keith E. Thayer
Professors emeriti: Ralph C. Appleby, Max L. Smith
Associate professor: Steven A. Aquilino
Associate professor emeritus: Thaxter H. Miller
Assistant professors: James M.S. Clancy, Donna L. Dixon, Peter S. Lund
Assistant professor emeritus: Arthur N. Kracht
Clinical associate professor: Robert J. Luebke
Clinical assistant professor: Lawrence R. Huber
Adjunct assistant professors: David R. Fritz, Robert A. Strug, John G. Wells
Adjunct instructor: Frederick R. Drexler
Graduate degree offered: M.S. in Prosthodontics

Prosthodontics is the dentistry specialty involving crowns, fixed partial dentures (bridges), removable partial dentures, complete dentures, maxillofacial prostheses, and implant prostheses.

Predoctoral Program

The predoctoral program provides students with the basic principles, practices, and concepts of prosthodontics required for the practice of general dentistry, through laboratory projects and treatment of patients with differing prosthodontic needs.

Graduate Programs

The department offers Master of Science and certificate programs. The primary purpose of the M.S. program in prosthodontics is to train and prepare dentists for careers in prosthodontic education and/or research. The certificate program is designed primarily for individuals who want to prepare themselves further for private practice in prosthodontics. Both programs satisfy the educational requirements for eligibility for the American Board of Prosthodontics examination. Students must meet all the requirements for the master's degree as outlined in the *Manual of Rules and Regulations of the Graduate College.*

Master of Science

The M.S. program prepares dentists for the practice of prosthodontics with a strong background in dental research. Students must complete a core curriculum, which includes the basic sciences, research methodology and thesis, and clinical prosthodontics. The clinical portion includes fixed, removable, maxillofacial, and implant prosthodontics. The thesis is based on students' original research with the aid of an adviser and thesis committee. In addition, students are required to satisfactorily complete an oral and/or written examination over the thesis and prosthodontics.

Certificate Program

The certificate program provides more clinical experience than the M.S. program and does not require a thesis. Students must complete a core curriculum, which includes the basic sciences, research methodology, and clinical practice—fixed, removable, maxillofacial, and implant prosthodontics.

Admissions

Minimum requirements for admission to both programs correspond to the minimum requirements for admission to the Graduate College. In addition, applicants must hold a D.D.S. or D.M.D. degree or its foreign equivalent. An interview may be requested. Both programs last a minimum of 24

months and usually begin July 1. Application deadline is November 1.

Courses

Predoctoral

84:122 Principles of Occlusion **2 s.h.**
Interdisciplinary introduction to concepts of occlusion and mastication.

84:140 Removable Prosthodontic Technique Lecture **3 s.h.**
Technical procedures in construction of complete and removable partial dentures.

84:141 Removable Prosthodontic Technique Laboratory **3 s.h.**
Laboratory exercises in construction of complete and removable partial dentures.

84:142 Fixed Prosthodontic Technique Lecture **3 s.h.**
Introduction to fixed prosthodontics, including definitions, materials, and techniques used in construction of various types of metal and porcelain fixed restorations.

84:143 Fixed Prosthodontic Technique Laboratory **3 s.h.**
Technical procedures required in construction of fixed prostheses.

84:160 Removable Prosthodontic Clinic **arr.**
Practice in dental clinic supplemented by individual supervision and demonstration.

84:165 Removable Prosthodontic Seminar **1 s.h.**
Seminars correlating previously acquired knowledge in biological and basic science and technique courses with clinical removable prosthodontics procedures.

84:170 Fixed Prosthodontics: Clinical Practice **arr.**
Practice in dental clinic supplemented by individual supervision and demonstration.

84:175 Fixed Prosthodontic Seminar **1 s.h.**
Seminars correlating previously acquired knowledge in biological and basic science and technique courses with clinical fixed prosthodontic procedures.

Graduate

84:220 Fixed Prosthodontics Seminar I **1 s.h.**
Overview of fixed prosthodontic procedures; research literature.

84:221 Fixed Prosthodontics Seminar II **1 s.h.**
Porcelain restorations and esthetics; research literature.

84:222 Fixed Prosthodontics Seminar III **1 s.h.**
Readings and discussion of topics related to diagnosis and treatment planning in fixed prosthodontics.

84:223 Occlusion Seminar **1 s.h.**
Assigned research topics.

84:224 Graduate Restorative Materials **2 s.h.**
Assigned research topics. Same as 82:224.

84:225 Complete Denture Seminar I **1 s.h.**
Principles, practices, and concepts of complete denture construction; current research.

84:226 Removable Partial Denture Seminar I **1 s.h.**
Principles, practices, and concepts of removable partial denture construction; current research.

84:227 Complete Denture Seminar II **1 s.h.**
Principles, practices, and concepts of complete denture construction; past research.

84:228 Removable Partial Denture Seminar II **1 s.h.**
Principles, practices, and concepts of removable partial denture construction; past research.

84:230 Research: Prosthodontics **arr.**
Literature review, protocol preparation, and data collection for selected research project.

84:231 Thesis Preparation: Prosthodontics **3 s.h.**
Preparation and defense of thesis from research project.

84:236 Biomaterials Research Methodology **1 s.h.**
Overview of materials research in the College of Dentistry; instruction in use of materials research equipment. Same as 82:236.

84:240 Advanced Clinical Removable Prosthodontics **arr.**
Treatment of patients requiring complete and removable partial dentures.

84:241 Technique Methods: Removable Prosthodontics **arr.**
Technical methods in construction of complete and removable partial dentures; assigned problems.

84:242 Practice Teaching: Prosthodontics **arr.**
Clinical and classroom teaching experience assigned by adviser.

84:245 Advanced Clinical Fixed Prosthodontics **arr.**
Treatment of patients requiring fixed prosthodontics.

84:246 Technique Methods: Fixed Prosthodontics **arr.**
Technical methods in fixed prosthodontics; assigned problems.

84:250 Journal Club **1 s.h.**
Prosthodontics; current literature.

84:251 Clinical Issues and Treatment Planning in Prosthodontics **arr.**
Seminars and patient presentations; focus on treatment planning and delivery for the complex prosthodontic patient.

84:252 Library Assignments: Prosthodontics **arr.**
Literature search and preparation of bibliographies and abstracts.

College of Education

Interim dean: Lowell A. Schoer
Associate dean emeritus: Lauren A. Van Dyke
Associate dean: Gary F. Hansen
Director, Connie Belin National Center for Gifted Education: Nicholas Colangelo
Director, educational placement: Judith D. Hendershot
Director, Iowa Testing Programs: Leonard S. Feldt
Degrees offered: B.A., B.S., M.A.T., M.A., M.S., Ed.S., Ph.D.

The nation's first university-level professorial chair in education was established at The University of Iowa in 1872. The department became the School of Education in 1907; and the College of Education, structured in the basic pattern that governs it today, was founded in 1913. The growth of the college has corresponded to the growth of the University.

Over the years, College of Education faculty members have been leaders in a variety of educational fields. Particularly noteworthy have been contributions in the fields of educational testing and measurement. They helped lay the foundation for today's testing and measurement industry, making Iowa City one of the best-known centers for this educational specialty.

The college has four divisions: counselor education; curriculum and instruction; planning, policy, and leadership studies; and psychological and quantitative foundations.

It is accredited by the National Council for Accreditation of Teacher Education (NCATE) through the doctoral degree for the preparation of elementary and secondary teachers and other professional school personnel. Teacher preparation programs also are reviewed and approved by the Iowa Department of Education.

Teacher Education Programs

The College of Education at The University of Iowa offers three major baccalaureate degree-based teacher preparation programs. Two of these, elementary education and health occupations education, involve professional education majors. The third program consists of the professional course work and academic majors required for secondary school teaching.

The college also provides numerous specialized elementary (including early childhood) and secondary added teaching endorsement programs.

Preparation for special education teaching is offered at the graduate level. A limited number of undergraduate special education courses also are open to all students having an interest in this area, to those from other teacher education programs, and to those planning to pursue graduate degrees in special education.

All students admitted to a teacher education program (TEP) must complete College of Liberal Arts General Education Requirements for the Bachelor of Arts, Bachelor of Science, or Bachelor of General Studies.

Undergraduate Admission to Teacher Education Programs

Undergraduate applicants to The University of Iowa who are interested in becoming teachers should indicate their proposed College of Education major or their interest in a secondary-level teaching endorsement program on the application for admission. Students already enrolled at the University who decide to enter a teacher education program and who meet eligibility requirements should submit an application to the College of Education, Office of Student Services, N310 Lindquist Center.

Application Deadlines

The deadline for application to teacher education programs is July 1. Applicants who do not meet the deadline may submit applications by either November 1 or April 1 for consideration and may be accepted if qualified and if openings in the program occur.

General Requirements

Admissions to teacher education programs are competitive. Admission requirements may vary by program area and are based on demand and faculty availability. In order to be considered for admission to a teacher education program, an undergraduate student must have:

Been admitted to The University of Iowa as a degree candidate;

Completed the American College Tests (ACT) or the Scholastic Aptitude Test (SAT);

Attained sophomore standing (completed 30 semester hours) prior to the semester during which enrollment is made in the foundations of education sequence of courses;

Achieved a 2.50 grade-point average on all college course work as well as course work completed at The University of Iowa; and

Applied for admission to a teacher education program.

Honors In Education

The College of Education Honors Opportunities Program is open to juniors and seniors who have attained a 3.50 grade-point average. Students with lower GPA's who have demonstrated their research potential may be accepted on the basis of an interview with the director. The Honors Opportunities Program consists of three components: 7X:100 Honors Seminar in Education; a research mentorship with optional credit; and a student development program including career counseling and social activities. The Honors Opportunities Program is housed in the Connie Belin National Center for Gifted Education.

Graduate Admission to Teacher Education Programs

Students who have completed a baccalaureate degree may be admitted to a teacher preparation program in one of two ways.

- They may apply to the Graduate College with their objective stated as "certification only" or in some secondary teaching areas with a Master of Arts in Teaching (M.A.T.) objective. Students selecting this route must satisfy the following conditions:

  Admission to the Graduate College;

  Completion of the Graduate Record Examination (GRE) General Test;

  A cumulative grade-point average of not less than 2.50 on undergraduate work and 3.00 for M.A.T. objective; and

  Admission to a specific certification program (e.g., elementary education, special education, or secondary English).

- They may apply to the College of Liberal Arts as postbaccalaureate students with senior standing. Students selecting this option should not apply as special students. Instead, they must apply to the appropriate teacher education program following the undergraduate admissions procedure and must meet the general requirements stated in the undergraduate admissions section. Application deadlines are the same as those for undergraduates.

Student Teaching

The final phase of the teacher education program is the professional semester, devoted to supervised student teaching and directed observation in a variety of situations. Periodic seminars provide for discussion and evaluation of student teachers' experiences. The student teaching requirement may not be met by transfer credit except under unusual circumstances and advance approval.

Admission to the senior year student teaching semester requires separate application. Applications must be submitted by March 15 of the academic year preceding the one during which the student teaching is to be completed to the Office of Student Services, N310 Lindquist Center. Opportunities for overseas and urban student teaching experiences are available. Admission to student teaching requires verification of satisfactory progress in meeting both College of Education standards and program area standards, which are set at the time of admission to the TEP and may be higher than the college minimum of 2.50.

Students should consult with their advisers regarding specific requirements for the program areas.

Waivers

Students who have completed practicum-type experiences or courses that they want to have considered in lieu of program requirements should consult with their advisers.

Urban Student Teaching

Students who want to advance their educational interests through student

teaching in an urban setting may apply through the Office of Student Field Experiences. Popular settings for urban student teaching include the CUTE Program (Cooperating Urban Teacher Education). This option is open to all education majors who meet the requirements for student teaching.

Overseas Student Teaching

Overseas student teaching experience is available in cooperation with the University of Wisconsin—River Falls. The overseas sites available include Ireland, England, Scotland, Wales, and Australia. In most locations, students are assisted with housing by the on-site coordinator. Interested students must meet the regular requirements for student teaching and must have the approval of their adviser and the appropriate division chair. Overseas assignments are for eight weeks. Secondary education students are required to complete a full semester in a U.S. assignment before student teaching overseas during a second semester. Elementary education students complete eight weeks in a U.S. assignment and eight weeks overseas during one semester.

State Requirements

All students seeking an Iowa teaching certificate must complete a course in human relations. This requirement can be met by completing 7F:180 Human Relations for the Classroom Teacher.

Teacher Education Minors

Acceptance into a teacher education program is prerequisite to registration for most College of Education undergraduate courses. However, the College of Education does offer four minors for students interested in being better informed about education. This interest may arise from a desire to be better informed as a parent, as a taxpayer, or as a future member of a local board of education. Students also may feel that a minor would help support future career objectives. The minors are general education, science education, human relations, and educational psychology. Descriptions of these minors are available in the Office of Student Services.

Teacher Certification Services

The Iowa Board of Educational Examiners issues teacher, support service, and administrator certificates on the recommendation of Iowa colleges and universities whose programs have been approved by the Iowa Department of Education. All University of Iowa preparation programs have Iowa Department of Education approval.

Other states have different certification requirements that call for some type of competency testing. Many states issue provisional certificates to graduates of institutions accredited by the National Council for Accreditation of Teacher Education. Most University of Iowa programs are accredited by the council.

Certification requirements across the nation are subject to change. Students who plan to seek employment in a state other than Iowa should make every effort to be informed about current requirements in that state. Generally, students who apply out-of-state should first secure Iowa certification.

To be recommended by The University of Iowa, applicants must complete all requirements of the appropriate approved program. A minimum of 20 semester hours of course work applied to meet program requirements must be earned at The University of Iowa.

The College of Education Office of Student Services provides Iowa application forms and certification assistance to all students completing approved programs offered by the college.

Graduate Programs

Graduate study in the College of Education is guided by the general regulations of the Graduate College, with additional requirements set by College of Education faculty. Graduate students in education register in the Graduate College and receive their degrees from that college. Graduate programs are available in the following areas of study:

Counselor Education—M.A., Ed.S., Ph.D.

Counseling and Human Development—M.A., Ed.S., Ph.D.
Rehabilitation Counseling—M.A., Ph.D.
Student Development in Postsecondary Education—M.A., Ed.S., Ph.D.
Substance Abuse Counseling—M.A.
Rehabilitation Psychology—Ph.D.
Marital and Family Therapy—Ph.D.

Curriculum and Instruction—M.A.T., M.A., Ed.S., Ph.D.

Art Education—Ph.D.
Behavior Disorders—M.A.
Curriculum and Supervision—M.A., Ph.D.
Developmental Reading—M.A.
Early Childhood Education and Care—M.A.
Early Childhood Special Education—M.A.
Elementary Education—M.A., Ph.D.
English Education—M.A.T., M.A., Ph.D.
Foreign Language Education—M.A.T.
Learning Disabilities—M.A.
Mathematics Education—M.A., Ph.D.
Mental Retardation, Mild/Moderate—M.A.
Mental Retardation, Moderate/Severe/Profound—M.A.
Multicategorical Resource—M.A.
Multicategorical Special Class with Integration—M.A.
Science Education—M.A.T., Ed.S.
Social Studies Education—Ph.D.
Special Education—Ed.S., Ph.D.

Planning, Policy, and Leadership Studies—M.A., Ed.S., Ph.D.

Educational Administration—M.A., Ed.S., Ph.D.
Higher Education—M.A., Ed.S., Ph.D.
Social Foundations of Education—M.A., Ph.D.

Psychological and Quantitative Foundations—M.A., Ed.S., Ph.D.

Counseling Psychology—Ph.D.
Educational Measurement and Statistics—M.A., Ph.D.
Educational Psychology—M.A., Ph.D.
Instructional Design and Technology—M.A., Ed.S., Ph.D.
School Psychology—Ed.S., Ph.D.

Master of Arts in Teaching

The M.A.T. program is a 42-semester-hour (minimum) nonthesis program designed for academically superior liberal arts graduates who completed few or no professional education courses in their undergraduate program. Requirements are listed in the Curriculum and Instruction section of the *Catalog*.

The program leads to a master's degree and certification as a secondary teacher in the fields of English, foreign languages, home economics education (must be completed by May 1992), and science education. A grade-point average of at least 3.00 on undergraduate course work is required for admission. At least 18 semester hours of graduate course work in the student's teaching field must be completed. A minimum of 20 semester hours of graduate work in education must be taken to satisfy certification requirements.

Master of Arts

The College of Education offers a Master of Arts degree with or without thesis. The nonthesis M.A. program usually provides more specialized course work than does the thesis program. The nonthesis program is not necessarily a terminal program, but students who expect to continue their studies in a doctoral program are urged to select the M.A. thesis program since it offers more experience in research procedures. Students who complete a nonthesis M.A. program and are admitted to a Ph.D. program may be asked to submit evidence of writing and research skills to their adviser or division during the early part of their doctoral program. Course credits earned more than ten years before the session in which the degree is to be conferred are not counted toward fulfillment of requirements for any master's degree. Of the minimum 30 semester hours required for the degree, at least 24 must be earned in University of Iowa courses after formal admission to the program, and at least 8 must be completed on campus.

Master of Science

Thesis and nonthesis programs are available for students in science education. The degree requirements are similar to those for the Master of Arts degrees. postbaccalaureate program designed for

students preparing themselves professionally in such fields as teaching, administration and supervision, and special services. Of the minimum 60 semester hours required for the degree, 28 must be in the area of specialization; the rest may be earned in cognate fields, supervised experience, research, and elective courses. The research must culminate in a written report. Other requirements and regulations for the Ed.S. degree are the same as for the master's degree, except that 15 semester hours of resident work on campus are required in one 12-month period or in two summer sessions, and course work completed ten years prior to the final examination must be evaluated to determine the amount of credit that may be accepted toward fulfillment of the program requirements.

Doctor of Philosophy

The Ph.D. is the highest academic degree. It is conferred upon students who have demonstrated superior scholarship and mastery of research skills in course work as well as in the preparation and defense of a dissertation.

Professional Improvement

Students are admitted to professional improvement status in a division rather than to degree candidacy. This is appropriate only for persons who are seeking to update their knowledge or are temporarily undecided about career plans. Students should file a change of status stating a specific program objective at the earliest opportunity.

Extramural Education

Through the Division of Continuing Education, selected College of Education courses are offered at off-campus sites and hours outside the traditional schedule. If taken after formal admission to a specific program, some of these courses may be applied to meet residency requirements for degrees. There are, however, special regulations governing such course work. Students should obtain prior approval from their program advisers before registering in extramural courses. Students not regularly admitted to The University of Iowa also may register in extramural courses, but credit earned prior to admission will not count toward residency requirements.

Support Units and Special Resources

Computer, Curriculum Resources

The College of Education Computer Resources Laboratory provides computer services to College of Education students. Students may use lab facilities to work on assignments or do research. The laboratory also assists students enrolled in development courses involved with computer-aided instruction, interactive videodisc instruction, and computer-managed instruction.

The Computer Resources Laboratory supports a variety of microcomputers and terminals on-line with University of Iowa mainframe and super-minicomputers. More than 500 pieces of software are available for checkout by registered students. Multiple copies of word processors, spreadsheets, databases, programming languages, utilities, and instructional courseware can be checked out to be used in the lab area.

The Curriculum Resources Laboratory provides instructional materials primarily for students and faculty members interested in early childhood, elementary, secondary, and special education. It brings into a convenient central location approximately 25,000 elementary and secondary textbooks, reference books, courses of study, bibliographies, pamphlets, and nonprint media such as filmstrips, games, records, and microcomputer software. The laboratory also houses a 29,000-volume youth collection.

Instructional Media Production

The Instructional Media Laboratory houses a variety of instructional equipment, materials, and services ranging from equipment checkout and microteaching facility use to the design and production of high-quality audio and video programs. Its facilities provide opportunities for skill development in design and production of instructional materials and in the operation of instructional equipment of all types. Laboratory staff members consult with students and faculty of the colllege on the production of color slides, overhead transparencies, video- and audio-tapes, and other materials related to instructional development. The laboratory also offers workshops and credit courses through the college.

Libraries

The Main Library and the Psychology Library provide books, periodicals, reference books, films, ERIC microfiche, tests, and a reserved book room for students and faculty.

Placement

The Educational Placement Office assists students and alumni seeking teaching, administrative, and related positions at all levels and in all fields. Services include individual consultation and group assistance with job search skills and employment tactics, information about job vacancies, establishment of a placement file, and the opportunity to interview with school recruiters on campus. An information center with resources covering career information, directories of schools, colleges, and agencies, and community and state data is available for students planning careers in education and related areas.

Iowa Testing Programs

The Iowa Testing Programs staff develops standardized educational tests, such as the widely used Iowa Tests of Basic Skills and Iowa Tests of Educational Development, for use in elementary and secondary schools. This department also conducts research studies in educational measurement and evaluation, publishes the results of these studies, sponsors lectures and symposia, provides consulting services to school systems, and provides training experience for graduate students in measurement and statistics.

Connie Belin National Center for Gifted Education

The Iowa State Board of Regents established the Connie Belin National Center for Gifted Education in 1988. Based in the College of Education, the center conducts research and service in gifted education. As a national resource, it also gathers and disseminates information on the education of gifted students.

Programs and services of the Belin Center include the Connie Belin Fellowship Program in Gifted Education; the Honors Opportunities Program; Invent, Iowa!; the Counseling Laboratory for Talent Development; the Henry B. and Jocelyn Wallace National Research Symposium on Talent Development; family counseling; consultation; educational assessment; practicum and internship experiences; and course work in gifted education. For more information, contact the Director, Connie Belin Center, 210 Lindquist Center, The University of Iowa, Iowa City, Iowa 52242.

North Central Association

The North Central Association (NCA) of Colleges and Schools is the largest and most active of six regional accrediting associations in the United States; Iowa is one of 19 member states. The NCA's primary purpose is to foster improvement in education at the elementary, secondary, and collegiate levels by self-examination of educational programs, visits by evaluation teams, and adherence to policies and standards for continued membership. The University of Iowa houses and supports the office of state director of the Iowa NCA State Committee.

Institute for School Executives

The Institute for School Executives is a membership organization for school districts and other educational agencies established and operated by the College of Education. Begun more than a decade ago, it provides continuing education and staff development opportunities for school administrators across the state.

An executive planning board of practicing school administrators provides direction and guidance for programming activities. Management and oversight are coordinated by faculty members of the Division of Planning, Policy, and Leadership Studies. Institute activities provide an excellent opportunity for school administrators and College of Education faculty and students to interact and exchange ideas, experience, and research information on a variety of topics.

Research Support

The Cooperating Schools Program has been a service of the College of Education since 1972. The program acts as a liaison for University faculty and students by coordinating research and class projects with school districts willing to participate in the studies. Approximately 40 requests from University faculty or students to conduct projects using students and staff from schools in Iowa and Illinois are processed each year. The dean's office provides support services for faculty research, development, and acquisition of grants and coordinates such efforts with the University's Division of Sponsored Programs.

Special Resources

The School Program for Emotionally Disturbed Children is located in the child psychiatry unit of the University's Psychiatric Hospital. Children attending this school are residential patients in the unit. The program is supported by the Psychiatric Hospital. Opportunities are available for student teaching and practicum experience in school psychological services.

The University Counseling Service provide research and practicum opportunities for students in counseling psychology.

University Hospital School is a University-affiliated facility and, as such, it strives to provide a viable balance of direct services to developmentally disabled youngsters, interdisciplinary training activities for personnel, and research projects in program development and effectiveness.

Financial Aid

Students interested in employment opportunities in any of the support units and special resources listed above should contact the director of each facility and indicate their interests, their academic and experience records, and their career or degree goals at The University of Iowa.

Graduate Assistantships

Individual academic programs provide opportunities for teaching, research, or service assistantships, as well as for fellowship and related employment opportunities. Inquiries should be addressed to the chair of the division or to the director of the special program in which the student believes he or she can provide service or achieve an outstanding academic record. If the student has applied for admission, his or her student file is available for review by those responsible for selecting the assistantship(s) for the student's program. Assistantship appointments are usually, but not always, made by the program area.

Special Graduate Assistantships in Education

The Iowa Testing Programs and the Iowa Measurement Research Foundation provide sufficient funds to support a limited number of special graduate assistantships in education. Students admitted to or pursuing any of the advanced degree programs offered by the College of Education are eligible to apply, provided they are committed to a professional career in the United States. The assistantships are for the academic year only and are renewable for a limited number of years. Holders are assigned to work under the direction of a faculty member in a research capacity and must be enrolled for not fewer than 6 nor more than 12 semester hours per semester. All candidates must submit transcripts of all college work completed (undergraduate as well as graduate), letters of recommendation, and scores on the Graduate Record Examination (GRE) General Test. The application must be filed on a special form available from the director of the Iowa Testing Programs, 334 Lindquist Center, College of Education. The application deadline is March 1.

College of Education Student Loan Fund

The college's student loan fund was established to assist College of Education students who are faced with extraordinary or unforeseen expenses while pursuing degree or certification programs. The borrower must be a senior or post-bachelor's degree student seeking teacher certification, or a graduate student seeking an advanced degree or certification in the College of Education. He or she must have completed the equivalent of two semesters of full-time course work at The University of Iowa, have a strong academic record, and demonstrate potential for success in the field of education.

Information and application forms are available from the director of college development, Educational Placement Office, N302 Lindquist Center.

College of Education Awards

Awards are presented to outstanding graduate students in the College of Education at the spring semester meeting of the college faculty. The awards include:

- The John Elderkin Bell Marriage and Family Therapy Award, presented annually to an outstanding graduate student in marriage and family therapy entering the dissertation phase of the doctoral program.
- The Blommers-Hieronymus Fellowship, awarded annually to a doctoral student in the field of educational measurement and statistics. Nominees must have completed at least one full year in the graduate program at The University of Iowa. The award is based on academic performance in graduate course work and professional promise in the field of measurement and statistics. The fellowship stipend supplements the recipient's teaching or research assistantship each year until graduation, to a maximum of three years.
- John Leonard Davies Memorial Award, presented to an outstanding graduate student majoring in education whose specialization is adult and continuing education.
- Howard R. Jones Achievement Award, presented to an outstanding graduate student who has made a noteworthy scholarly presentation at a national professional conference or published a significant scholarly article in a reputable professional journal or other substantial printed work.
- Perry Eugene McClenahan Award, presented to the outstanding candidate for an advanced degree in educational administration.
- Leonard A. Miller Memorial Award, presented to an outstanding first-year M.A. student majoring in rehabilitation counseling.
- The Melvin R. Novick Award, presented annually to a student enrolled in the doctoral program in educational measurement and statistics. It goes to a third- or fourth-year student with at least a year of study remaining who has shown the most outstanding academic performance and promise of the highest level of achievement in research in this field.
- The award honors Professor Melvin R. Novick (1932-1986) for his significant contributions to the field of educational measurement and statistics and for his devoted service to the arts and educational programs at The University of Iowa. The fund is established from income realized from the sale of computer programs (CADA) developed by Professor Novick.
- Paul C. Packer Award, presented to the outstanding candidate for the Master's Degree in Education.
- Pi Lambda Theta Award—Senior, M.A., and Ph.D. levels, presented to outstanding students of high scholarship who show promise in the professional areas of research, teaching, or writing and exhibit striking personal qualities.
- The Betty Piercy Scholarship Award, presented to an outstanding student in reading who is expected to benefit the field in some direct way.
- Franklin Stone International Student Award, presented to an outstanding international student pursuing a Ph.D.

• James and Coretta Stroud Fellowship for Doctoral Study in Educational Psychology, Measurement, or Statistics, awarded to an outstanding graduate student in the Division of Psychological and Quantitative Foundations who is entering the dissertation phase of study.

• Janet R. Zober Memorial, awarded to an outstanding student preparing to teach the physically handicapped, including the hearing impaired.

Faculty

All tenure-track faculty members with professional rank hold earned doctorates in their teaching fields, and the majority have had teaching or administrative experience in the public schools. A major strength of the college is its close working relationship with the College of Liberal Arts.

Interdivisional Courses

7X:000 Cooperative Education Internship **0 s.h.**
Students participating in cooperative education internships register during work assignment periods; registration protects full-time student status and provides a permanent transcript record of participation. Consent of faculty required. Prerequisite: satisfactory completion of cooperative education requirements.

7X:100 Honors Seminar in Education **1 s.h.**
Introduction to research and education and related professions with presentations by College of Education faculty; students select a faculty member with whom to collaborate on research.

7X:110 Topics in International Education **1-2 s.h.**
Topics in education in the United States and foreign nations; issues of relevancy and application of educational theory and practice in different nations; topics depend on national origins of class members.

7X:111 Cross-Cultural Education in Mexico **arr.**

COUNSELOR EDUCATION

Chair: Albert B. Hood
Professors: Nicholas Colangelo, Richard Dustin, Harold B. Engen, Albert B. Hood, David A. Jepsen
Professor emeritus: C. Esco Obermann
Associate professors: Charles D. Claiborn, Barbara Kerr, Dennis R. Maki, William A. Matthes, Ralph R. Roberts, Jr., David M. Rosenthal
Associate professor emerita: Lauralee Rockwell
Assistant professor: Anita Leal
Adjunct assistant professors: Nancy Barceló, Kay Colangelo, Cheryl Hetherington, Phillip Jones, Jerry Starkweather
Adjunct instructors: Arthur Schut, Orville Townsend
Adjunct lecturer: Ray Manning
Degrees offered: M.A., Ed.S., Ph.D.

The Division of Counselor Education is primarily involved in the preparation of practitioners and scholars at the graduate level, through degree programs in student development in postsecondary education, rehabilitation counseling, counseling and human development, substance abuse counseling, and marital and family therapy. The division also offers basic courses in interviewing and interpersonal skills for students in other professional and graduate programs, as well as for undergraduates.

Admission

Detailed information on admissions and program requirements is presented in the brochure "Programs for Advanced Degrees," available from the Division of Counselor Education.

All applicants for the Master of Arts, Education Specialist, and Doctor of Philosophy degrees are typically expected to meet the following admission requirements:

Completed graduate application form;

Copies of official transcripts of all previous college work—undergraduate and graduate;

Official report of Graduate Record Examination (GRE) General Test scores—verbal and quantitative;

A statement of the candidate's reasons for seeking an advanced degree in counselor education, including a statement of personal career objectives;

A personal or telephone interview if requested;

Three current letters of recommendation from persons in a position to assess both the applicant's prospects for completing either the M.A., Ed.S., or Ph.D., and his or her serious commitment to the profession.

In addition to the above, the following requirements must be met for the individual programs.

Master of Arts: An undergraduate grade-point average of 2.75 or better and a composite (verbal and quantitative) GRE General Test score of 1000 or higher.

Specialist in Education: A graduate grade-point average of 3.25 or better, and a composite (verbal and quantitative) GRE General Test score of 1000 or higher.

Doctor of Philosophy: An undergraduate grade-point average of 3.00 or better, or a graduate grade-point average of 3.30 or better if a graduate degree has been completed; composite (verbal and quantitative) GRE General Test score of 1100 or higher.

Typically, doctoral students are not admitted unless they have completed a master's degree in counseling or a related field. Relevant work experiences are important. Students who are accepted without a master's degree (including a master's unrelated to counselor education) must complete core master's-level course work before taking doctoral-level advanced courses. Master's-level courses and experiences to be completed are determined in consultation with the adviser and are included in a student's curriculum plan.

Foreign Students

Foreign students also must provide a Test of English as a Foreign Language (TOEFL) score with their applications. Typically, a score of 580 is required. Depending on the TOEFL score, the division may require students to take and pass University of Iowa course work in English usage that is designed especially for them.

Final Decision, Special Requirements

All the criteria listed above are considered minimum standards for consideration for admission. Final decisions on admissions are made by faculty committees. Also, some programs may have specific admission requirements due to certification standards. For example, a teaching certificate is required for students pursuing certification in school counseling. Any special admission requirements are listed with individual programs.

Conditional Admissions

Applicants who do not meet all the minimum requirements for regular admission consideration may still be admitted on a conditional basis if the faculty determines that there are strengths and promises warranting conditional status. The following are divisional conditions:

M.A. Level—Students must complete 12 semester hours of core courses (approved by an adviser) over two consecutive sessions and earn a minimum cumulative grade-point average of 3.00.

Ph.D. Level—Students must complete 12 semester hours of core courses (approved by an adviser) over two consecutive sessions and earn a minimum cumulative grade-point average of 3.30.

Maintaining Candidacy

All graduate students must meet the following standards in order to maintain their candidacy for degree:

Maintain necessary grade-point average level in their curriculum plan: M.A.—3.00; Ed.S.—3.25; Ph.D.—3.30.

Successfully complete practicum, internship, or equivalent professional experience.

Maintain professional behavior consistent with the American Association for Counseling and Development code of ethics, and any additional code of professional ethics adhered to in any agency in which the student completes a practicum or internship.

Demonstrate progress toward the degree through successful completion of hours specified in the curriculum plan; progress toward the degree requires active registration each session; exceptions may be approved by the adviser.

The academic and professional progress of division students is reviewed annually.

Probational Status

M.A. students who earn an overall grade-point average lower than 3.00 and Ph.D. students who earn a grade-point average lower than 3.30 are put on probational status. Students on probational status have two consecutive sessions to raise their grade-point average. If that requirement is not met, the student may be removed from the program. Each student is allowed one probational status during his or her program of study.

Application Deadlines

Deadlines for the M.A. and Ed.S. programs are June 1 for fall semester; November 1 for spring semester; and April 1 for summer session. The Ph.D. program deadline is March 1 for fall semester.

Applications must be complete before they will be reviewed. Applicants are responsible for providing a complete application dossier. Application forms are available from the Division of Counselor Education secretary, N338 Lindquist Center, The University of Iowa, Iowa City, IA 52242; phone (319) 335-5275. Applicants can check on whether an application dossier is complete by contacting the Office of Student Services, N310 Lindquist Center, The University of Iowa, Iowa City, IA 52242; phone (319) 335-5000.

Applicants are notified in writing immediately after admission applications have been reviewed. Applicants who are accepted must reply in writing in order to maintain their admission status.

Graduate Programs

Student Development in Postsecondary Education

Master of Arts

The M.A. program provides preparation for college positions in admissions, student activities, financial aid, student unions, career planning and placement, residence halls, foreign student services, community college counseling, adult and continuing education, and external degree programs. With experience, it is a foundation for positions as student deans and college teachers.

No specific program of undergraduate study or work experience is required for admission to the M.A. program. A personal interview is desirable, but not required.

Specialist in Education

The Ed.S. program provides specialized professional preparation in college student development beyond the master's level for persons not planning to enter doctoral study. It helps to prepare candidates for positions such as associate dean or dean of students in a small college; or as a director of admissions, student activities, financial aid, a student union, career planning and placement, residence halls, foreign student services, a community college counseling service, adult continuing education, or external degree programs.

Doctor of Philosophy

The Ph.D. program provides preparation for positions such as counselor educator, researcher, associate dean or dean of students; or as a director of admissions, student activities, financial aid, a student union, career planning and placement, residence halls, foreign student services, a community college counseling service, adult continuing education, or external degree programs.

The M.A. thesis or its equivalent is not necessary for admission to the Ph.D. program. But, in order to take the Ph.D. comprehensive examination, students must offer an M.A. thesis or equivalent as evidence of ability to do research.

Rehabilitation Counseling

Master of Arts

The M.A. program (accredited by the Council on Rehabilitation Education) provides preparation for work in state rehabilitation agencies, rehabilitation facilities, rehabilitation centers, private rehabilitation agencies, mental hospitals, prisons, and in other public and private agencies concerned with the rehabilitation of adults.

Doctor of Philosophy

The Ph.D. program provides preparation for leadership in rehabilitation counselor education, research, and service programs in universities, state agencies, and programs in public institutions and the private sector.

Applicants who have recently graduated from an M.A. program in rehabilitation counseling and who have not had at least one year of full-time work experience in rehabilitation counseling are not considered. Work experience is highly desirable and enhances the application.

Ph.D. in Rehabilitation Psychology

The Ph.D. program is intended to meet the needs of students who are primarily interested in working as professionals in institutional and clinical settings and who may be interested in becoming licensed psychologists. It also prepares students for teaching, research, and service in academic, agency, and other institutional settings, both public and private. This program is a designated psychology program of the National Register of Health Service Providers in Psychology.

As with the Ph.D. program in rehabilitation counseling, applicants for rehabilitation psychology will not be considered unless they have at least one year of full-time, paid work experience in the field of rehabilitation following the completion of their M.A. program.

Counseling and Human Development

Certification

Applicants with a master's degree in counseling or a related field, elementary or secondary school teaching certification, and at least one year of successful teaching experience may apply for certification only in school counseling. Counseling and human development provides preparation for certification as elementary school counselor (K-6) and secondary school counselor (7-12). Postsecondary counselor certification only is available for applicants with master's degrees and postsecondary teaching certificates.

Master of Arts

The M.A. program, accredited by the Council of Accreditation of Counseling and Related Professions (CACREP), provides preparation for counseling in a variety of school settings.

Specialist in Education

The purpose of the Ed.S. program is to enable school counselors and counselor supervisors to increase their competence beyond the master's level.

Doctor of Philosophy

The Ph.D. program, accredited by CACREP, provides preparation for teaching, leadership, and research positions in counseling and related fields.

Substance Abuse Counseling—M.A.

The purpose of the M.A. program in substance abuse counseling is to prepare individuals to function in a wide variety of community counseling settings. The emphasis is on individual, group, and family counseling.

Marital and Family Therapy—Ph.D.

This doctoral program is designed to prepare students with knowledge and advanced counseling skills, specifically in the area of marital and family therapy. Graduates are prepared to provide leadership in this field as researchers, teachers, supervisors, and clinicians.

Facilities

A wide variety of counselor education practicum experiences is available in neighboring community agencies, schools, and colleges, as well as throughout the University.

Financial Aid

Depending on federal funding, graduate training fellowships may be available for students entering rehabilitation counseling. Many other graduate students in the Division of Counselor Education hold a wide variety of graduate assistantships. For example, many of the University's student service units award part-time assistantships to graduate students in the division. Applicants for assistantships should contact the coordinator of the particular counselor education graduate program they plan to enter.

Courses

7C:81 Making a Vocational-Educational Choice 2 s.h.
The vocational decision-making process, self-evaluation, and exploration of the world of work; for students who are uncertain about their educational and vocational directions.

7C:112 Human Sexuality 1-3 s.h.
Physiological and psychological aspects of human sexuality. Same as 42:112, 17:117, 96:112.

7C:133 Culturally Different in Diverse Settings 3 s.h.
Problems in serving culturally different students in schools and social service settings: relevant research on the influence of a disadvantaged background on students' learning potential. Same as 7U:133.

7C:136 Programming for the Gifted 3 s.h.
Fundamental issues; focus on curriculum approaches to working with the gifted. Same as 7U:141.

7C:137 Education of the Gifted 2-3 s.h.
Introduction to fundamental issues; curriculum, counseling, family issues, gender and minority issues. Same as 7U:137.

7C:138 Introduction to Educating Gifted Students 3 s.h.
Overview of fundamental issues; curriculum, counseling, family issues, gender and minority issues.

7C:150 Psychological Aspects of Women's and Men's Roles 1-3 s.h.
Introduction to the psychological aspects of women's and men's roles; sex role development and socialization in a variety of settings; strategies for change.

7C:162 Introduction to Marriage and Family Counseling and Psychotherapy 3 s.h.
Initial sessions focus on evolution of the family therapy movement and issues related to functional and dysfunctional family systems; latter sessions examine significant models of family therapy and specific techniques.

7C:178 Microcounseling 1,3 s.h.
The foundation skills of listening, responding, empathy, and focus; the advanced skills of meaning, confrontation, reframing, directives, and action skills; large-group video instruction with closed-circuit video feedback for small-group practice sessions.

7C:180 Workshop in Counselor Education arr.
Topics for the continuing education of counselors and related professionals.

7C:181 Workshop in Gifted Education 1-3 s.h.

7C:182 Workshop for Helping Professionals 1-2 s.h.
One-week workshop; students choose one of 18 topics for community practitioners working with or interested in individuals, groups, families, and organizations.

7C:185 Introduction to Substance Abuse 2-3 s.h.
Attitudes, values, language, artifacts, and myth; specific information on psychoactive drugs; current substance abuse issues including family, intervention, prevention, and treatment; historical perspectives in substance abuse.

7C:188 Practicum in Teaching and Curriculum Development in Gifted Education 1-6 s.h.
Includes experience in developing course materials for classes offered through the Belin Center. Same as 7E:188, 7S:188, 7U:188.

7C:190 Group Processes for Related Professions 3 s.h.
Small-group procedures for personal and organizational development in educational settings; demonstrations supplement discussions of theoretical issues and research findings; participation in a personal growth group. Consent of instructor required.

7C:193 Individual Instruction in Counselor Education—Undergraduate arr.
Consent of instructor required.

7C:199 Counseling for Related Professions 3 s.h.
Introduction to counseling theory and techniques for nonmajors.

7C:202 Introduction to Group Counseling 3 s.h.
Survey of research, theory, and practice in group counseling; participation in groups and examination of various leadership styles. Counselor education major or consent of instructor required.

7C:203 Career Guidance and Job Placement 3 s.h.
Prepares counselors to help people learn about, decide upon, and enter work roles; topics include career development concepts and theories, work environments, career guidance goals and objectives, exemplary methods and materials, and evaluation procedures.

7C:204 Group Processes for School Counselors 3 s.h.
Advanced theory, research, and applications of group processes in school settings. Consent of instructor required.

7C:210 Rehabilitation Client Assessment 3 s.h.
Orientation to the process and practice of assessing adults with disabling conditions for rehabilitation plan development and decision making.

7C:216 Group Leadership in Human Sexuality 0-3 s.h.
Same as 42:216, 96:216. May be repeated.

7C:221 Foundations of Counseling 3 s.h.
Philosophical bases, processes, and issues surrounding predominant counseling theories and techniques; master's-level course for majors in counselor education. Counselor education major or consent of instructor required.

7C:222 Interventions for Primary Prevention in Schools 3 s.h.
Students plan and carry out programs of primary prevention in the schools, grades K-12; conflicts inherent in normal personality development; current societal conditions that commonly lead to individual distress.

7C:232 Therapy with Couples 2 s.h.
Marital and other couples as social systems; theories of functional and dysfunctional systems; techniques of intervention. Same as 42:232.

7C:237 Seminar in Gifted Education 3 s.h.
Teaching and counseling needs of gifted students K-12; intensive three-week residential program. Open only to teachers with a Belin Fellowship. Consent of instructor required.

7C:241 Introduction to Rehabilitation Services 2 s.h.
Historical, philosophical, legislative, and societal overview of rehabilitation process and practice; roles of rehabilitation professionals, nature of rehabilitation agencies, resources, issues.

7C:242 Rehabilitation Counseling 2 s.h.
Counseling process as an interpersonal helping procedure in rehabilitation settings; critical issues and procedures in the counseling process; students practice counseling skills. Consent of instructor required.

7C:244 Rehabilitation Counseling: Industrially Injured Workers 3 s.h.
Rehabilitation service delivery; history and philosophy of workers' compensation laws, role and function of rehabilitation specialists in the private sector.

7C:247 Medical Aspects of Disability 3 s.h.
Orientation to medical evaluation as part of the rehabilitation process; body systems, medical terminology, and medical description of disabilities; functional limitations; projection of potential for rehabilitation applied to planning and placement.

7C:251 Family Therapy 3 s.h.
Same as 42:251.

7C:254 Appraisal in Counseling 3 s.h.
Introduction to aptitude, interest, and personality tests used for assessment in counseling and personnel selection; laboratory practice in test administration, scoring, interpretation, and reporting. Prerequisite: 7P:143 or equivalent or concurrent registration.

7C:255 Vocational Psychology 3 s.h.
Major concepts and research evidence in vocational behavior; theories of vocational choice, adjustment, and development.

7C:262 Marriage and Family Counseling and Psychotherapy 3 s.h.
Counseling theory and techniques as applied to problems of marriage and the family; advanced course. Consent of instructor required. Prerequisite: 7C:162 or equivalent.

7C:263 Consultation Theory and Practice 2-3 s.h.
Study and analysis of various models of consultation, such as behavioral and mental health. Same as 7P:263, 7W:263.

7C:264 Laboratory in Consultation 1-3 s.h.
Practice and training in the competencies of consultation. Open only to students in counselor education. Consent of instructor required. Corequisite: 7C:263.

7C:266 Consulting in the School with Teachers and Parents 2 s.h.
Mental health and behavioral consulting in the schools; for educational supervisors, administrators, school psychologists.

7C:270 Issues and Ethics in Counseling 2-3 s.h.
Survey of ethical standards and current issues concerning counseling in schools and agencies; emphasis on professional practice.

7C:271 Ethical Issues in School Counseling 1 s.h.
AACD and ASCA ethical standards in school counseling; for school personnel other than counselors.

7C:280 Topical Seminar in Counselor Education arr.
Special topics dealing with contemporary problems of concern to counselors in specific settings. May be repeated.

7C:281 Introduction to Computer Technology in Counselor Education 1 s.h.
Master of Arts candidacy in counselor education or consent of instructor required.

7C:283 Advanced Seminar: Family Counseling for School-Related Problems 3 s.h.
School-related problems as they relate to the family; survey of family counseling theories; demonstration of a variety of intervention strategies; for counselors and school psychologists.

7C:284 Advanced Seminar: Counseling Theory and Applications for School Settings 3 s.h.
Emphasis on recent developments in theory; time-limited counseling for children and adolescents; behavior change techniques such as relationship building, anxiety reduction, assertiveness, and problem solving.

7C:285 Treatment Approaches to Substance Abuse and Dependency 3 s.h.
Developmental and historical perspectives; physiological issues related to substance abuse/dependency, assessment, and evaluation; diagnostic systems and diagnosis for groups with differential concerns (e.g., adolescents, women, minorities, elderly); differential treatment modalities and major methods of intervention in treatment planning. Same as 42:284.

7C:286 Issues in Substance Abuse Treatment and Clinical Management 3 s.h.
Critical survey of issues in substance abuse treatment; emphasis on clinical management in different substance abuse treatment settings.

7C:288 Practicum in Substance Abuse Counseling arr.
Supervised practice in counseling clients with substance-related problems; for students in the substance abuse counseling program. Consent of instructor required.

7C:290 Practicum in Group Facilitation arr.
Supervised practice in working as facilitator and/or cofacilitator in counseling groups and other types of growth groups. Consent of instructor required. Prerequisite: 7C:202 or equivalent.

7C:293 Individual Instruction in Counselor Education arr.
Consent of instructor required.

7C:301 Practicum in Elementary School Counseling arr.
Supervised experience in an elementary school setting (K-6); emphasis on roles and expectations of a counselor. Consent of instructor required.

7C:302 Practicum in Secondary School Counseling arr.
Supervised experience in a secondary school setting (7-12); emphasis on roles and expectations of a counselor. Consent of instructor required.

7C:303 Practicum in Mental Health Counseling arr.
Supervised experiences in a variety of community settings; emphasis on roles of a counselor in an agency, community mental health center, and similar settings. Consent of instructor required.

7C:304 Practicum in Postsecondary Counseling arr.
Supervised experience in postsecondary school settings such as community colleges, colleges, and related settings; emphasis on roles of the counselor in postsecondary school settings. Consent of instructor required.

7C:311 Practicum in Counseling and Psychological Services for Gifted Students 1-6 s.h.
Educational, personal, and family issues for graduate students who have had course work in counseling education, counseling psychology, school psychology, educational psychology, or related fields. Consent of instructor required. Prerequisite: 7C:178 or equivalent. Same as 7P:311.

7C:330 Introduction to Student Services 3 s.h.
History, philosophy, and status of student personnel services; emphasis on student development theory, environmental assessment, and redesign as an approach to program planning and decision making.

7C:331 The College Student 2-3 s.h.
Psychological and sociological characteristics of college students; student development theories and implications for higher education.

7C:332 Seminar: Student Services 2-3 s.h.
Intensive study and seminar presentation of current issues, problems, and conflicts related to certain areas of student personnel administration in higher education. May be repeated. Ph.D. candidacy or consent of instructor required.

7C:333 Practicum in Student Services arr.
Supervised practice in college student personnel agencies. May be repeated. Consent of instructor required.

7C:335 Administration of Student Services 3 s.h.
Organization theory; theories of administration, personnel administration, human relations; and other aspects of management for college student personnel workers.

7C:341 Job Development Placement and Follow-up 2 s.h.
Obtaining appropriate jobs for handicapped individuals who have received rehabilitation services; client, counselor, employer, and job specifications. Consent of instructor required.

7C:342 Seminar: Psychological Aspects of Disability 1 s.h.
Psychological problems and adjustments of persons with disabilities and others with whom they interact.

7C:351 Practicum in Rehabilitation Counseling arr.
Supervised experience with clients in a rehabilitation agency. May be repeated. Consent of instructor required.

7C:352 Internship in Rehabilitation Counseling arr.
Full-time experience in rehabilitation settings; provides the counselor-in-training with a wide range of rehabilitation activities under supervision. Consent of instructor required.

7C:353 Advanced Counseling and Psychotherapy 3 s.h.
Theories and techniques of counseling clients with personal and interpersonal problems. Consent of instructor required.

7C:356 Student Services Program Development 3 s.h.
Techniques of assessment, implementation, and evaluation of programs for college students; practical course.

7C:357 Advanced Group Counseling and Psychotherapy 3 s.h.
Survey of theories and techniques of group counseling and psychotherapy; integration of theory into supervised experience and research on group counseling. Consent of instructor required.

7C:360 Advanced Practicum in Counseling arr.
Supervised practice in counseling; intensive analysis of counselor styles and methods; for advanced graduate students enrolled in school counselor education program. Consent of instructor required. Prerequisite: an introductory practicum in counseling.

7C:361 Advanced Practicum for School Counselors 1-3 s.h.
Advanced supervised practicum for school counselors. Admission to School Counseling Institute or consent of instructor required.

7C:362 Family Therapy Techniques 1 s.h.
Marital and family therapy techniques; role plays, case presentations, and critiques of master therapists' videos. Consent of instructor required. Prerequisites: basic marital and family therapy courses. Corequisite: 7C:370.

7C:366 Organization Development and Change 3 s.h.
Same as 7P:366, 7W:366.

7C:369 Psychological Treatment of Human Sexuality 3 s.h.
Research background and in-depth knowledge base of sexual dysfunctions and their treatment modalities with special populations; experiential component designed to help students differentiate between value judgments and factual information. Consent of instructor required. Prerequisite: 7C:112 or equivalent.

7C:370 Marriage and Family Practicum arr.
Students work exclusively with families (four to six families during a semester); supervision on campus as well as at the participating agency. Consent of instructor required. Pre- or corequisite: 7C:262.

7C:371 Advanced Practicum in Individual, Marital, and Family Therapy arr.
Supervised practice in individual, marital, and family therapy; supervision on campus as well as at the participating agency. Consent of instructor required. Prerequisites: 7C:370 and experience in individual, marital, and family therapy.

7C:380 Practicum in College Teaching arr.
Supervised college teaching experience in counselor education courses; teaching in collaboration with faculty, observation and critiques of staff teaching, participation in course planning and evaluation procedures; for qualified graduate students. Consent of instructor required.

7C:393 M.A. Thesis in Counselor Education arr.
Consent of instructor required.

7C:394 M.A. Equivalency Research in Counselor Education 1-3 s.h.
Consent of instructor required.

7C:395 Educational Specialist Research in Counselor Education arr.
Consent of instructor required.

7C:396 Action Research in School Counseling 1-3 s.h.
Principles and techniques of designing and executing applied research in schools. Consent of instructor required.

7C:400 Professional Seminar and Ethics in Counselor Education 3 s.h.
Advanced seminar; focus on professional and ethical issues in counselor education. Ph.D. candidacy in counselor education or consent of instructor required.

7C:453 Supervision of School Counselors 1-3 s.h.
Advanced theory, research, and applications of supervising school counselors. Consent of instructor required.

7C:454 Seminar on Counselor Supervision 3 s.h.
Study of conceptual models, research, and practicum design in counselor supervision. Prerequisite: advanced practicum or equivalent.

7C:455 Supervising the Counseling Practicum arr.
Supervision of students enrolled in counseling practicum. Consent of instructor required. Prerequisite: 7C:360 or equivalent. Pre- or corequisite: 7C:454.

7C:456 Supervising the Marital and Family Therapy Practicum arr.
Supervision of students enrolled in a marital and family therapy practicum. Consent of instructor required.

7C:460 Seminar: Research in Counseling 3 s.h.
Study of methods, examples, and problems of counseling research. Ph.D. candidacy or consent of instructor required.

7C:493 Ph.D. Thesis in Counselor Education arr.
Consent of instructor required.

CURRICULUM AND INSTRUCTION

Chair: Harold L. Schoen
Professors: Jack Bagford, Louise Beltramo, Robert M. Fitch, Alan R. Frank, Beatrice A. Furner, Alfred Healy, Kenneth A. Kavale, Dorothy T. McDonald, William H. Nibbelink, John E. Penick, Paul M. Retish, Harold L. Schoen, Richard Shepardson, James Shymansky, Lloyd Smith, Douglas M. Trank, Margaret G. Weiser, Robert E. Yager, Marilyn Zurmuehlen, Marilyn J. Zweng
Professors emeriti: G. Robert Carlsen, John H. Haefner, Clifford E. Howe, Jerry N. Kuhn, Camille J. LeVois, J.E. McAdam, Lauren A. Van Dyke
Associate professors: John W. Conner, George W. Cossman, Richard Elardo, Gary F. Hansen, Jo M. Hendrickson, Geoffrey Hope, David K. Leslie, John W. McLure, Darrell G. Phillips, Edward L. Pizzini, Cathy M. Roller, Jeannette Scahill, Daniel S. Sheldon, Jerry Watson, John T. Wilson, Sara Wolfson
Associate professors emeriti: Louis F. Brown, John Kiraly, Jr., Archie J. McKinnon, Louane L. Newsome
Adjunct associate professor: John Nietupski
Assistant professors: Chris Rodgers Arthur, Don D. Coffman, Linda G. Fielding, Susan Hamre-Nietupski, James D. Marshall, Kenneth Phillips, Leslie L. Schrier
Assistant professors emeriti: Iva M. Bader, Murray Martin
Adjunct assistant professor: Theresa M. Oehmke
Instructor: Richard P. Johns
Lecturer: Dennis Corwin
Degrees offered: B.A., B.S., B.G.S., M.A.T., M.A., M.S., Ed.S., Ph.D.

The division's programs prepare graduates for positions in public schools, local and state education agencies, clinical settings, and institutions of higher education. They are approved by the Iowa Department of Education and the National Council for Accreditation of Teacher Education. Undergraduate students pursuing a major in elementary education must meet the College of Liberal Arts requirements for either the B.A., B.S., or B.G.S. degree.

Teacher Education, Certification

Before taking required professional education courses, undergraduate students must be admitted to the teacher education program (TEP). The application for admission should be submitted to the College of Education Office of Student Services, N310 Lindquist Center. The deadline for applications is July 1. Applications also may be submitted by November 1 or April 1. Qualified applicants who apply on these dates will be admitted if there are openings in classes.

In order to be considered for admission, students must have completed a minimum of 30 semester hours of course work with a minimum cumulative grade-point average of 2.50. For some subject areas, additional criteria must be met. A limited number of applicants are accepted into each subject area TEP, so a 2.50 grade-point average does not ensure admission. Admissions decisions are based on grade-point average in the major and other criteria relevant to teaching success.

If at any time after admission the grade-point average falls below 2.50, the student is placed on probation for one semester. If a 2.50 is not attained during the probationary semester, the student is dropped from the TEP. Students should consult a College of Education adviser in their program area, or the Division of Curriculum and Instruction Office, N259 Lindquist Center, for more information on admissions criteria.

Graduate students who apply to the Graduate College for "certification only" or to an M.A.T. program do not have to apply separately for admission to the teacher education program. Their admission to either graduate program includes admission to the TEP. The deadline for applications to either program is June 1. Applications submitted by either October 1 or March 1 also are considered.

A limited number of applicants are accepted into each program area TEP, so meeting the Graduate College admission requirements does not ensure admission. Admission decisions are based on grade-point average in the undergraduate major and other criteria relevant to teaching. Upon admission to the TEP, students are assigned an education adviser.

Admission to Student Teaching

Admission to the TEP permits students to take certain College of Education courses and requires a 2.50 cumulative grade-point average. Admission to the student teaching semester, however, requires a separate application and review of each student's credentials and progress to ensure that the student is qualified for placement in the profession. Verification that the student meets the grade-point standards established by their program area at the time of admission to the TEP occurs at the time of application for student teaching. Students should consult their education adviser or the Division of Curriculum and Instruction office for more information about the admissions process and requirements for student teaching in their certification program.

Elementary Education

Foundation Courses

These three courses must be completed before any methods courses are begun:

7E:91 Pre-Education Practicum, Elementary Education	2 s.h.
7E:100 Introduction: Elementary and Early Childhood Teaching	3 s.h.
7P:75 Educational Psychology and Measurement	3 s.h.

These two courses should be completed before methods are begun, but may be completed during the first semester of methods courses:

7W:91 Audiovisual Equipment for Instruction	1 s.h.
7W:92 Introduction to Microcomputing for Teachers	1 s.h.
Total	10 s.h.

Methods Courses

Three courses taken concurrently:

7E:123 Literature for Children I	2 s.h.
7E:160 Methods: Elementary School Language Arts	3 s.h.
7E:164 Methods: Elementary School Reading	3 s.h.

Four courses taken concurrently:

7E:161 Methods: Elementary School Social Studies	2 s.h.
7E:162 Methods: Elementary School Science	2 s.h.
7E:163 Methods: Elementary School Mathematics	2 s.h.
7E:166 Mathematics-Sciences Practicum	1 s.h.
7E:120 Methods and Materials: Music for the Classroom Teacher	2 s.h.
or	
7E:122 Methods and Materials: Art for the Classroom Teacher	2 s.h.
7E:127 Methods and Materials: Physical Education for the Elementary Teacher	2 s.h.
or	
7E:128 Methods and Materials: Health Education for the Elementary Teacher	2 s.h.
Total	19 s.h.

Other Requirements

7U:130 Exceptional Persons	3 s.h.
7F:180 Human Relations for the Classroom Teacher	3 s.h.

Area of Specialization

A minimum of 24 semester hours must be completed in one of the following areas of specialization: art, early childhood, English language arts, health, history, mathematics, music, physical education, reading, science, social science, special education, speech communication/theater. Copies of the requirements for each area of specialization are available in the Division of Curriculum and Instruction office. Courses in the area of specialization may be taken pass/nonpass if they are offered with the pass/nonpass option. Courses in some areas of specialization are sequenced in a definite pattern leading up to student teaching; others have no required sequence and may be completed before or after student teaching. Students should consult with their advisers if they have questions.

Student Teaching

7E:170 Classroom Management	2 s.h.
7E:190 Supervised Teaching Elementary School: Interactive Phase	6-7 s.h.
7E:191 Supervised Teaching in the Elementary School: Pre- and Post-Active Phase	5,7 s.h.
7E:192 Special Area Student Teaching	0,3 s.h.
Total	16 s.h.

Transfer students must complete at least eight semester hours of course work, including two courses numbered 7E:160-7E:164, or 7E:123 at The University of Iowa prior to student teaching. A minimum of 14 semester hours of student teaching is required.

The liberal arts and elementary requirements total approximately 113-139 semester hours. Students who meet or test out of the rhetoric, foreign language, math, and other liberal arts requirements may be able to satisfy their program requirements in as few as 113 semester hours.

Adding Endorsements to Certificates

The undergraduate elementary education program is designed specifically to prepare students to teach kindergarten through sixth grade. As an addition to the K-6 Iowa endorsement, students may complete requirements for the Iowa prekindergarten/kindergarten endorsement or an Iowa subject area endorsement (see "Area of Specialization," above). Students seeking the prekindergarten/kindergarten endorsement must complete the elementary major, the early childhood specialization, and the following additional courses.

*7E:120 Methods and Materials: Music for the Classroom Teacher	2 s.h.
*7E:122 Methods and Materials: Art for the Classroom Teacher	2 s.h.
7E:134 Parent-Teacher Communication	3 s.h.
7E:169 History and Philosophy of Early Childhood Education	3 s.h.
7E:189 Development and Administration of Child Care Centers	3 s.h.
7E:197-198 Supervised Teaching Early Childhood Center	7,14 s.h.

*Either 7E:120 or 7E:122 may be taken as part of the elementary major.

Students seeking teacher education or endorsements in other states must assume the responsibility of determining what extra requirements have to be met. Addresses for other state certification offices are available in the College of Education Student Services Office, N310 Lindquist Center.

Secondary Education

Undergraduate students seeking secondary school certification are degree candidates in the College of Liberal Arts and must complete the requirements for the Bachelor of Arts, Bachelor of Science, or Bachelor of General Studies degrees described in the

College of Liberal Arts section of the *Catalog*.

Graduate students may be admitted to a program leading to teacher certification as "certification only" candidates in the Graduate College. They are subject to all policies, rules, and regulations of that college. Eligible graduate students also may complete teacher certification by pursuing an M.A.T. degree in English education, home economics education (must be completed by May 1992), foreign language education, or science education.

Certification requires a major of at least 30 semester hours of course work in a subject area taught in the secondary school. Course requirements for each major are available in the Division of Curriculum and Instruction Office, N259 Lindquist Center. Candidates for secondary school teaching certification also may receive approval to teach in additional subject areas by completing an approved program of 24 or more semester hours of course work in those areas.

Secondary school teacher preparation programs are provided in the following areas:

Art
*Coaching
Communication studies (speech communication/theatre arts)
English
Foreign languages—Spanish, French, German, Russian, Latin, Chinese, and Japanese
*Health education
**Home economics
Journalism
Mathematics
Music
Physical education
*Reading
Science, including general science, physical science, biology, chemistry, physics, and earth science
Social science, including anthropology, economics, geography, history, political science, psychology, and sociology

*Available as an additional approval area only. A major in another subject matter area is required for certification.

**The home economics program will be closed after May 1992. Only students who can complete their home economics courses by that date may enter the secondary school TEP in home economics.

An Iowa secondary teaching certificate qualifies holders to teach in grades 7-12. Students planning to teach art, music, or physical education typically complete a program that prepares them for both elementary- and secondary-level certification.

Secondary teacher preparation programs in several other subject areas also offer a program that leads to certification as a subject matter specialist in grades K-6. This K-6 certification is available only in the same subject area as the secondary certification. Mathematics and science education require completion of the elementary specialist certification. Completion of the elementary specialist certification is highly recommended for foreign language education.

Candidates are encouraged to obtain more information and the name of an adviser from the Curriculum and Instruction Office, N259 Lindquist Center.

Requirements

Undergraduate candidates for certification to teach in secondary schools must complete the following requirements, in addition to the requirements in their major.

One course from 7S:90-7S:99 Introduction to Teaching (a specific subject area, except science education)	2-3 s.h.
7S:100 Issues in Education	2 s.h.
7P:75 Educational Psychology and Measurement	3 s.h.
7F:180 Human Relations for the Classroom Teacher	3 s.h.
One or more methods of teaching courses in the major field	3-9 s.h.
Competency in computer-based education (CBE) (may be satisfied by taking 7W:92 Introduction to Microcomputing for Teachers, by examination, or by completing a CBE course or module in the subject area)	0-1 s.h.
Student teaching	12 s.h.

With an adviser's approval, a graduate student may elect equivalent graduate courses in lieu of 7S:90-7S:99, 7S:100, 7P:75, and 7W:92. Students must complete the methods courses in their major teaching fields before student teaching.

For all subject areas, student teaching must be done all day for a full semester. Students in secondary education may do their student teaching at the Center for Urban Teacher Education (CUTE), through the Regents' Exchange Program, or in the customary contractual area established by the College of Education. An exception to student teaching in the customary contractual area will be considered only if the proposed student teaching site provides the student with a specific program opportunity not available in the contractual area or utilizes special cooperating teacher expertise.

Students also may do student teaching in Europe via the Consortium for Overseas Student Teaching; however, overseas student teaching is in addition to and not a substitute for one of the student teaching options described above.

Additional information about alternatives for student teaching and application procedures is available from the Office of Student Services, N310 Lindquist Center. Applications for student teaching must be filed in the Office of Student Services by March 15 prior to the academic year during which the student teaching will be done.

Special Education

Students may be admitted to the Graduate College for the purpose of obtaining one or more teaching certificates in special education. For course requirements, see specific programs listed for the Master of Arts under "Special Education" in this section of the *Catalog*. Also see admission requirements under "Special Education."

Financial Aid

Early Childhood, Elementary Education

A number of teaching assistantships are available for graduate students pursuing advanced programs in early childhood and elementary education. Specific assignments vary. Some involve supervising undergraduate majors enrolled in practicums, and some involve teaching sections of undergraduate methods courses and supervising student teachers. Most assistantships are classified as one-half time. This classification permits students to register for a maximum of 12 semester hours of credit per semester. Graduate students with assistantships must register for a minimum of 6 semester hours per semester.

All assistantships are awarded on a competitive basis. To be considered for an assistantship, applicants must have been admitted to regular status in the Graduate College and accepted in an advanced program by the College of Education. Inquiries concerning assistantships should be directed to the division chair.

Secondary, Special Education

A limited number of assistantships are available for graduate students pursuing advanced degrees. Holders of such assistantships may register for no more than 12 semester hours and, except with special permission, no less than 6 semester hours per semester. Assignments vary. Some involve teaching undergraduate courses or supervising practicum experiences, and others are made up primarily of research activities.

Secondary education graduate students also may be eligible for assistantships in some College of Liberal Arts departments. A candidate with appropriate credentials should apply directly to the specific department or consult the College of Education adviser directing the program in the appropriate field.

Traineeships in selected certification and master's degree programs are available to full-time special education students. The Janet Zober Memorial Tuition Stipend is available each year to one student who is pursuing a special education teaching certificate. Preference is given to students working toward certification in physical disabilities.

Graduate Programs

Early Childhood Education

Master of Arts

The Master of Arts program in early childhood education is designed to prepare persons to administer programs and/or deliver education and care to children from infancy through the early primary grades in private or public settings, or to serve as early childhood consultants or community college instructors. It is offered in thesis and nonthesis options.

Admission

Students must meet the general admission requirements of the Graduate College and have an undergraduate grade-point average of 2.50. Students must hold a valid prekindergarten/kindergarten or elementary endorsement or equivalent.

Non-native students must have a TOEFL score of at least 550 to be eligible for admission; those with scores of 550 to 600 are admitted conditionally and must sit for an English evaluation before registering for courses. Course work recommended by English proficiency evaluators must be completed before conditional status can be changed. English proficiency course credit may not be applied toward the master's degree.

Requirements

The thesis option requires a minimum of 30 semester hours of credit; the nonthesis option requires 32.

Foundation Courses

7E:169 History and Philosophy of Early Childhood Education	3 s.h.
7E:189 Development and Administration of Child Care Centers	3 s.h.
7E:264 Building Foundations for Reading: Preprimary and Primary	3 s.h.
7E:267 Curriculum Development in Early Childhood (5-8 Years)	3 s.h.
7E:268 Curriculum Development in Early Childhood (0-5 Years)	3 s.h.
Total	15 s.h.

Related Courses

One of these (or an approved substitute):

7P:206 Advanced Child Development	3 s.h.
31:114 Cognitive Development of Children	3 s.h.

One of these:

17:114 Parent-Child Relationships	3 s.h.
7E:134 Parent-Teacher Communication	3 s.h.
7P:263 Consultation Theory and Practice	2-3 s.h.
Total	5-6 s.h.

Areas of Specialization

Curriculum

Students must complete at least 11 semester hours of credit in courses chosen from one or two content areas such as reading and/or language arts, mathematics, science, social studies, music, art, children's literature.

Human Relationships

Four of these:

7U:130 Exceptional Persons	3 s.h.
7E:280 Supervision of Student Teachers and Auxiliary Personnel	2-3 s.h.
17:114 Parent-Child Relationships	3 s.h.
7E:134 Parent-Teacher Communication	3 s.h.
7P:263 Consultation Theory and Practice	2-3 s.h.
Total	10-12 s.h.

Community College Teaching

All of the following must be completed for the endorsement Post-Secondary Certification for Arts and Sciences.

7H:171 The Community College	2-3 s.h.
7H:192 Curriculum Development in Community College and Health Careers	3 s.h.
7H:270 Intern Seminar	1-3 s.h.
7H:175 Post-High School Staff Development Workshop	0-2 s.h.
7H:112 Teaching of Adults	3 s.h.
7H:370 College Teaching Internship	arr.
7P:150 Introduction to Educational Measurement	3-4 s.h.

Counseling

7C:162 Introduction to Marriage and Family Counseling and Psychotherapy	3 s.h.
7C:178 Microcounseling	1,3 s.h.
7C:190 Group Processes for Related Professions	3 s.h.
7C:222 Interventions for Primary Prevention in the Schools	3 s.h.
7P:263 Consultation Theory and Practice	2-3 s.h.
Total	12-15 s.h.

Social Work

42:145 Organization and Community Practice	3 s.h.
42:196 Family Violence	3 s.h.
42:220 Family Law	3 s.h.
42:262 Social Policy and Interdisciplinary Systems, Domestic and International	3 s.h.
Total	12 s.h.

Thesis/Research

7P:143 Introduction to Statistical Methods	3 s.h.
7P:150 Introduction to Educational Measurement	4 s.h.
7E:392 Field Service Project	3 s.h.
or	
7E:393 M.A. Thesis in Early Childhood and Elementary Education	2 s.h.
Total	9-10 s.h.

Comprehensive Examinations

All students take one written examination in general early childhood education. Nonthesis students take a second written examination in their elected area of specialization. Thesis students take a second, oral examination related to their thesis or field-service project.

Note: This program does not lead to the Iowa endorsement for teaching prekindergarten/kindergarten or to any other teaching endorsement, with the exception of postsecondary certification when all the required courses in that area of specialization have been successfully completed.

Elementary Education

Master of Arts

This program is designed to prepare master's degree candidates in elementary education to serve as team leaders, grade level or subject area supervisors, curriculum consultants, or master teachers.

Admission

Admission requirements are the same as those established by the Graduate College. In addition, applicants must have completed an undergraduate program of teacher preparation in either early childhood or elementary education. Graduate students who have not completed an undergraduate program in elementary education must be admitted initially as "certification only" students.

Requirements

The thesis option requires 30 semester hours of credit, the nonthesis option 32; 24 semester hours must be taken in University of Iowa courses, with 8 semester hours completed on campus. Course work completed ten or more years before admission does not count toward the M.A. requirements.

Foundations and Educational Psychology

Two of these (4-7 s.h.):

7F:102 History of American Education	2 s.h.
7F:117 Philosophies of Education	2,3,5 s.h.
7F:130 Educational Sociology	2-3 s.h.
7P:131 Educational Psychology	3 s.h.
7P:143 Introduction to Statistical Methods	3 s.h.
7P:150 Introduction to Educational Measurement	3-4 s.h.
7P:181 Introduction to Theories of Learning	3 s.h.
7W:120 Introduction to Instructional Design and Technology	3 s.h.

Research and Curriculum

Both of these (7 s.h.):

7E:304 Seminar: Current Issues and Research in Elementary Education	4 s.h.

7E:300 Design and Organization of Curriculum 3 s.h.

Instructional Improvement

Three of these (6-9 s.h.):

7E:204 Literature for Children II 3 s.h.
7E:260 Supervision of Elementary School Language Arts 3 s.h.
7E:261 Supervision of Elementary School Social Studies 3 s.h.
7E:262 Advanced Techniques of Teaching Science in the Elementary School 3 s.h.
7E:263 Supervision of Elementary School Mathematics 2-3 s.h.
7E:264 Building Foundations for Reading: Preprimary and Primary 2-3 s.h.
or
7E:265 Supervision of Intermediate Grade Reading 3 s.h.
7E:267 Curriculum Development in Early Childhood (5-8 Years) 3 s.h.
or
7E:268 Curriculum Development in Early Childhood (0-5 Years) 3 s.h.
7E:280 Supervision of Student Teachers and Auxiliary Personnel 2-3 s.h.

Area of Specialization

A minimum of 10 semester hours of credit in courses chosen with consent of the adviser; may include appropriate courses listed above.

Electives

From 0 to 5 semester hours of credit in courses chosen with consent of the adviser.

Thesis

7E:393 M.A. Thesis in Early Childhood and Elementary Education 2-3 s.h.

Comprehensive Examinations

The comprehensive examination consists of two three-hour examinations. One three-hour section is based on the general field of elementary education; the second centers on the candidate's area of specialization.

M.A. in Developmental Reading

This degree program prepares graduate students for positions as reading specialists in kindergarten and grades 1-12. The course work required develops the skills, knowledge, and competencies needed for supervisory, curricular, and remedial teaching positions in reading. The program also builds a background in reading for students who want to specialize further in the area and eventually to teach and/or conduct research in a college or university.

Successful completion of this program, combined with one year of successful teaching experience that includes the teaching of reading as a significant part of the responsibility, qualifies the student for certification as a reading specialist.

Admission

Students must meet the general requirements of the Graduate College, have an undergraduate grade-point average of 3.00, hold an early childhood, elementary, or secondary school teaching certificate, and show evidence of completing two years of a successful teaching experience.

Requirements

A minimum of 33 semester hours with thesis, 35 without thesis, is required. The following courses are required of all candidates:

7P:170 Introduction to the Psychology of Reading 3 s.h.
7E:171 Reading Clinic: Teaching Techniques 2-3 s.h.
7E:172 Reading Clinic: Teaching Practicum 2-3 s.h.
7E:264 Building Foundations for Reading: Preprimary and Primary 2-3 s.h.
7E:265 Supervision of Intermediate Grade Reading 3 s.h.

Either of the two following courses:

7S:194 Methods: High School Reading 2-3 s.h.
7S:195 Developing Reading Skills in Secondary Schools 2-3 s.h.

Either of the two following courses:

7P:150 Introduction to Educational Measurement 3 s.h.
7E:174 Diagnostic and Prescriptive Approaches to Reading Instruction K-12 1-4 s.h.

Either of the two following courses:

7S:294 Seminar: Secondary Reading 3 s.h.
7E:308 Seminar: Research and Current Issues (Reading) 3 s.h.

One of the following courses:

7P:106 Child Development 3 s.h.
7P:131 Educational Psychology 3 s.h.
7P:133 The Adolescent and Young Adult 3 s.h.

One of the following courses:

7S:186 Curriculum Foundations 2-3 s.h.
7S:291 Secondary School Curriculum 2-3 s.h.
7E:300 Design and Organization of Curriculum 3 s.h.
7D:290 Improving Instruction in the Secondary School 3 s.h.

One of the following courses:

7E:280 Supervision of Student Teachers and Auxiliary Personnel 2-3 s.h.
7D:383 Supervision and Evaluation 3 s.h.
7E:365 Reading Clinic: Supervision arr.

Thesis (if relevant); one of the following:
7E:393 M.A. Thesis in Early Childhood and Elementary Education
7S:393 Master's Degree Thesis
7P:393 M.A. Thesis in Educational Psychology, Measurement, or Statistics

Students, in consultation with their adviser, may select the remaining hours as elective from areas such as curriculum, supervision, language arts, testing and evaluation, linguistics, or speech pathology.

Students take six hours of comprehensive examinations. One examination is based on reading courses. The other is based on course work in supporting areas. With the agreement of adviser and the student's committee, a comprehensive project may be substituted for the written examination in the supporting areas.

M.S. in Elementary Science Education

The Master of Science program in elementary science prepares master's degree candidates to serve as team or departmental science specialists. The program may be taken with thesis (30-semester-hour minimum) or without (32-semester-hour minimum).

Admission

Admission requirements are the same as those established by the Graduate College. In addition, applicants must have completed an undergraduate program of teacher preparation in elementary education.

Requirements

The following courses are required of all candidates:

7E:255 Science Education: Issues, History, and Rationale 3 s.h.
7E:256 Science Education: The Nature of Science 3 s.h.
7E:257 Science Education: Teaching, Learning, and Curriculum Models 3 s.h.
7E:262 Advanced Techniques of Teaching Science in the Elementary School 3 s.h.

Science courses (18 semester hours) are selected by the candidate in consultation with the adviser. A series of application courses (97:102 Societal and Educational Applications of Earth and Environmental Sciences, 97:103 Societal and Educational Applications of Life Sciences, and 97:105 Societal and Educational Applications of Physical Sciences) are an integral component of the science courses. Candidates who have not taken comparable courses are expected to take two application courses. At least one corresponding science discipline course as a pre- or corequisite is to be taken with the application courses. These courses, along with the electives (up to 6 semester hours), are determined in consultation with the adviser. All candidates for the Master of Science degree must satisfy the requirements for a basic science endorsement as outlined in the October 1988 Iowa Certification Rules.

Doctor of Philosophy

The doctoral program in elementary education prepares students for college and university teaching and research positions in elementary education, and for research, curriculum, supervisory, or administrative

positions in public school systems and government educational agencies.

Admission

Candidates for admission to the program should have a combined score of at least 1000 on the verbal and quantitative sections of the Graduate Record Examination (GRE) General Test. The required grade-point average for continuation in the program is that prescribed by the Graduate College.

Requirements

The program requires a minimum of 90 semester hours of credit, including credit earned for the dissertation. Each student prepares an individual plan of study in consultation with an adviser. The final plan must be approved by the adviser and the division chair.

The doctoral program should include a strong background of elementary education course work. Each program also must include two areas of concentration, one of which must be outside of elementary education. Examples are English, library science, elementary administration, and child development. Commonly selected areas within elementary education are children's literature, curriculum, language arts, early childhood, mathematics, reading, and social studies.

All doctoral candidates must demonstrate competence in using appropriate research tools, as approved by the adviser.

Secondary Education

The Division of Curriculum and Instruction offers, or jointly administers with departments in the College of Liberal Arts, advanced degree programs in the following fields of professional interest: art education, communication studies education, curriculum and supervision, developmental reading, English education, foreign language education, home economics education (through May 1992), mathematics education, music education, physical education, science education, and social studies education.

In some fields, only master's-level programs are offered, whereas in other fields, educational specialist and Ph.D. degree programs also are offered. All degrees offered are listed below, grouped by program area.

M.A. in Art Education

The Master of Arts program is administered by the School of Art and Art History in cooperation with the College of Education. Students make application for admission to the School of Art and Art History.

The purpose of the program is to prepare highly qualified teachers of art for elementary and secondary schools and community colleges. The strong academic emphasis of this program assists teachers who are themselves creative artists to become highly literate in the history and language of art.

Admission

Applicants must have completed the equivalent of the minimum course work in art required for the B.A. or B.F.A. degree in art from The University of Iowa, and a certificate to teach art. Applications must be accompanied by a representative portfolio of the candidate's work, consisting of eight slide reproductions of art work and one example of written work. The written work may be a paper previously written for a course or it may be an original paper. Deficiencies in undergraduate art or courses recommended for teacher certification are evaluated following admission so that students can make up required course work concurrent with work for the degree. Candidates must meet Graduate College requirements for admission.

Requirements

M.A. candidates must complete the following:

Studio and art history (18 s.h.): either 12 semester hours of studio art and 6 semester hours of art history, or 12 semester hours of art history and 6 semester hours of studio art;

Art education seminars (8 s.h.): the course 7S:367 Seminar: Current Issues in Art Education;

Twelve semester hours to be specified after the student begins the program;

Thesis: either a written or studio thesis; if a studio thesis is elected, the student must pass M.A. clearance in the School of Art and Art History;

Comprehensive examinations: a written and/or oral examination in art education; students may elect a three-hour examination or a one-week research question.

Ph.D. in Art Education

The doctoral degree program is administered by the College of Education with the cooperation of the School of Art and Art History. Students make application for admission to the College of Education.

The program prepares college teachers and researchers in art education and supervisors of art in state departments of education and school systems. It also provides students with an opportunity to continue inquiry and creative work in art history and in studio.

Admission

Students must meet the general requirements for doctoral students in the Graduate College and have an M.A. degree in art education from The University of Iowa or an equivalent degree from an accredited degree-granting college or university. Application to the program must be accompanied by a representative portfolio of the candidate's work, consisting of 12 slide reproductions of art work and two examples of written work. The written work may consist of papers previously written for a course or original papers. These should be submitted to the office of Art Education, 13 North Hall.

In the case of course work deficiencies, students must register for pertinent courses. One year of successful teaching experience in an elementary or secondary school is required prior to admission or completion of the doctoral program.

Requirements

Students must complete at least 60 semester hours of graduate work beyond the M.A., planned with the adviser, including at least 15 semester hours in the School of Art and Art History, 15 semester hours in art education seminars, 15 semester hours in a related area (e.g., aesthetics, anthropology, higher education, early childhood education, psychology, sociology), and 15 semester hours in thesis and tool courses; 7E:306 Introduction to Research in Art Education is also required.

Students take comprehensive examinations, both oral and written. The written examination consists of an in-depth research problem assigned by the examining committee, to be completed within 14 days. An oral examination on the project is then held (the written portion of the examination is not intended to relate directly to the dissertation proposal).

Students must satisfactorily complete a written dissertation that constitutes a contribution to scholarship, for at least 12 semester hours of credit; the student is expected to prepare a dissertation proposal and defend it before the dissertation committee; an oral examination on the dissertation is the Ph.D. final examination.

M.A. in Communication Studies Education

The program prepares teachers and supervisors of speech communication for secondary and postsecondary positions.

Admission

Candidates must have a grade-point average of 2.75. Candidates without prior academic background in speech communication may need to take additional courses beyond the minimum requirement. Application should be made to the Department of Communication Studies, Communication Studies Building.

Requirements

A minimum of 30 semester hours of approved graduate courses, at least 24 of them at The University of Iowa, including:

Two graduate courses in communication education;

Two graduate courses in a second division of the department;

Two graduate courses in a third division of the department;

36:300 Introduction to Research;

Three 200- or 300-level courses; and

Other courses recommended by the adviser and/or committee.

Successful completion of a paper or project involving substantial scholarly investigation and writing, usually done in a seminar or independently under the direction of an adviser. The project or paper must be circulated to the committee with the comprehensive examination.

A comprehensive examination consisting of three two-hour segments to be defined and limited by the student and an adviser when the plan of study is prepared.

M.A. in Curriculum and Supervision

The purpose of the program is to prepare teachers and administrators for positions as consultants, directors, and coordinators in secondary school curriculum development.

Admission

Students must meet the general requirements of the Graduate College. Teaching experience is desirable.

Requirements

Common Core (19-20 s.h.):

7S:186 Curriculum Foundations	2-3 s.h.
7F:117 Philosophies of Education (or its equivalent)	2 s.h.
7P:257 Educational Measurement and Evaluation	3 s.h.
or	
7P:255 Construction and Use of Evaluation Instruments	
or	
7P:150 Introduction to Educational Measurement	
7S:281 Junior High School and Middle School Curriculum	3 s.h.
7S:291 Secondary School Curriculum	3 s.h.
7E:300 Design and Organization of Curriculum	3 s.h.
Research tool, selected in consultation with the adviser, typically	
7P:143 Introduction to Statistical Methods	3 s.h.
Cognates, in a subject field such as English	4-6 s.h.
Electives—selected in consultation with adviser	4-6 s.h.
Thesis, for students electing a thesis program:	
7S:393 Master's Degree Thesis	2-4 s.h.
Total	30-32 s.h.

Two three-hour comprehensive examinations, one in curriculum and one in a related field in education or in a cognate field; or three two-hour examinations.

Ph.D. in Curriculum and Supervision

This program is administered by the College of Education. It prepares students for leadership positions in the field of curriculum for secondary schools, state departments, intermediate systems, and college teaching.

Admission

Students must meet the general requirements of the Graduate College, hold a valid teaching certificate, and have at least two years of teaching experience. Applicants must be approved for admission by a faculty review committee.

Requirements

A minimum total of 90 semester hours including other approved graduate course work is required.

Common Core (36-42 s.h.):

7S:186 Curriculum Foundations	2-3 s.h.
7S:281 Junior High School and Middle School Curriculum	3 s.h.
7S:291 Secondary School Curriculum	3 s.h.
7E:300 Design and Organization of Curriculum	3 s.h.
7S:391 Problems of Curriculum Planning	3 s.h.
At least two advanced supervision courses in secondary or elementary school subject fields	6 s.h.
7P:257 Educational Measurement and Evaluation	3 s.h.
or	
7P:255 Construction and Use of Evaluation Instruments	
or	
7P:150 Introduction to Educational Measurement	
7S:293 Individual Instruction in Secondary Education (Practicum)	2-3 s.h.
A minimum of two research tools, typically statistics, data processing, research design, or foreign language	9-12 s.h.
Electives, to be chosen in consultation with adviser	6-8 s.h.
Recommended electives include:	
7F:130 Educational Sociology	2 s.h.
7F:117 Philosophies of Education	2 s.h.
7P:131 Educational Psychology	3 s.h.
7P:170 Introduction to Psychology of Reading	3 s.h.
7D:297 Administrative Leadership Theory	4 s.h.
7W:120 Introduction to Instructional Design and Technology	3 s.h.
7U:130 Exceptional Persons	3 s.h.

All doctoral candidates are required to complete at least 8 semester hours of cognate work in areas such as sociology, psychology, or political science.

7S:493 Ph.D. Thesis	10-18 s.h.

Candidates take three three-hour comprehensive examinations in secondary school curriculum and two related fields in education or in a cognate field.

M.A. in English Education

The program prepares supervisors of English, department chairs, curriculum specialists for secondary schools, and teachers of specialized areas. Application should be made to the College of Education.

Admission

Students must meet the general requirements of the Graduate College, hold a secondary school teaching certificate, and have acquired a minimum of 20 semester hours in English. Preferred applicants will have a composite score of 1000 on the verbal and analytical portions of the Graduate Record Examination (GRE) General Test. Students must maintain a 3.00 grade-point average while enrolled in the program.

Requirements

Students specialize in English education and one or two other areas. The other area(s) may be: a literary field, junior high school teaching, curriculum, reading, writing, speech and drama, journalism, language development, literature for children and adolescents. Students and their advisers plan the program of study. Nine semester hours must be earned in courses numbered 200 or above. Students take a comprehensive examination in English education and in their chosen area(s).

M.A.T. in English Education

The M.A.T. degree program is designed for students who have an undergraduate degree in English and few or no professional education courses. Successful completion of the program enables students to receive certification as secondary school teachers of English.

Admission

Applicants must have a bachelor's degree in English and a minimum undergraduate grade-point average of 3.00. Since this is a certification program, candidates must not have qualified for certification previously. Applicants are expected to have no more than 6 semester hours of course work in professional education courses prior to admission.

Requirements

Students must complete a minimum of 45 semester hours. This includes at least 18 semester hours of graduate courses offered by the Department of English, planned with the adviser to supplement the undergraduate major; and the following professional education courses:

7P:131 Educational Psychology	3 s.h.
7F:107 History of Western Education	
or	
7F:117 Philosophies of Education	2-3 s.h.
7S:190 Individual Projects in Laboratory Practice	1-3 s.h.
7F:180 Human Relations for the Classroom Teacher	3 s.h.
7S:194 Methods: High School Reading	3 s.h.
or	
7S:195 Developing Reading Skills in the Secondary School	3 s.h.

Basic competency in microcomputing

7S:115 Methods: English	3 s.h.
7S:187 Seminar: Curriculum and Student Teaching	2 s.h.
7S:191-192 Observation and Laboratory Practice in the Secondary School	12 s.h.

A two-part comprehensive examination is required. One part covers methods, materials, and curriculum for high school English; the second part covers one-half the comprehensive examinations administered to Master of Arts (literary studies) candidates in the Department of English.

Ph.D. in English Education

This program is administered by the College of Education. It prepares teacher educators in English, specialists in literature for young people, specialists in reading at secondary and junior college levels, specialists in writing at secondary and junior college levels, and coordinators/supervisors of language arts programs.

Admission

Students must meet the basic requirements of the Graduate College for admission to a doctoral program. In addition, they must have a secondary school teaching certificate, a grade-point average of 3.00, a minimum composite score of 1000 on the verbal and analytical portions of the Graduate Record Examination (GRE) General Test, and two years successful teaching experience. Students admitted to the program are expected to provide evidence of the successful completion of a substantial research paper for a course included in the first 15 residence hours. Students must maintain a 3.00 grade-point average while enrolled in the program. Candidacy is reevaluated annually.

Requirements

A minimum of 72 semester hours is required. This includes 9-16 semester hours in the area of specialization—teaching of English—including four of the following courses:

7E:260 Supervision of Elementary School Language Arts (Language Arts)	3 s.h.
7E:308 Seminar: Research and Current Issues (Sec. 30)	arr.
7S:315 M.A. Seminar: English Education	3 s.h.
7S:415 Ph.D. Seminar: English Education (required for two or more registrations)	2-4 s.h.

Cognates and electives (56-63 s.h.) may include reading, school curriculum, literature for young people, literature of a particular period or genre, educational psychology, special education, educational media, writing, linguistics, literary criticism, educational measurement, journalism, speech and dramatic arts. Students and their advisers select two areas of specialization in addition to the teaching of English. Areas of specialization typically consist of a minimum of 9 semester hours of work in an area.

Students must have facility in a research tool that will help them achieve professional objectives. Choice of research tool is agreed upon by students and their advisers.

Students must take comprehensive examinations in three areas: the teaching of English, a cognate area, and an elective area. The minimal requirements for eligibility to write cognate or elective area examinations varies; the general requirement is three courses in an area.

Students write a dissertation (typically 12 semester hours).

M.A.T. in Foreign Language Education

The M.A.T. program in foreign language education is designed for superior liberal arts graduates who have had few or no professional education courses. Successful completion of the program leads to secondary school teacher certification.

Admission

A bachelor's degree with a major in a foreign language and a 3.00 undergraduate grade-point average are required.

Requirements

Students must complete at least 18 semester hours of graduate courses in a foreign language department and the following professional education courses:

7S:92 Introduction to Teaching Foreign Language (credit not applicable to M.A.T. degree)	2 s.h.
7P:131 Educational Psychology	3 s.h.
7F:107 History of Western Education or 7F:117 Philosophies of Education	2 s.h.
13:123 Topics in Foreign Language Instructional Technology (same as 9:158, 35:117)	2 s.h.
7S:116 Methods: Foreign Language	3 s.h.
7S:191-192 Observation and Laboratory Practice in the Secondary School	12 s.h.
7S:187 Seminar: Curriculum and Student Teaching	1 s.h.
7F:180 Human Relations for the Classroom Teacher	3 s.h.

A comprehensive examination covering the candidate's knowledge of and proficiency in the language, literary or cultural analysis, and foreign language education.

M.A., M.A.T. in Home Economics Education

The Master of Arts program is administered by the Department of Home Economics. Admission to the Master of Arts in Teaching program is through the College of Education. Both programs are described under "Home Economics" in the College of Liberal Arts section of the *Catalog*.

Both programs will be closed after May 1992. Only students who can complete their home economics courses by that date may enroll in the program.

M.A. in Mathematics Education

The program provides students with advanced specialization in mathematics and education as a better foundation for teaching at the secondary level.

Admission

Candidates must meet the admission requirements of the Graduate College and, except in unusual cases, hold a professional certificate to teach secondary school mathematics. A combined score of 1000 on the verbal and quantitative sections of the Graduate Record Examination (GRE) General Test is preferred.

Requirements

A minimum of 10 semester hours of course work in mathematics approved by the student's adviser.

A minimum of four courses in mathematics education, which must include 7S:235 Current Issues in Mathematics Education (2-3 s.h.); the remaining three courses are to be selected from the following:

7S:230 Workshop in Secondary School Mathematics	1-3 s.h.
7S:231 Computer-Based Teaching of Secondary School Mathematics	2-3 s.h.
7S:236 The Teaching of Geometry	2-3 s.h.
7S:238 Teaching the Low Achiever in Mathematics	2-3 s.h.
7S:239 Teaching of Algebra	2-3 s.h.
7S:335 Seminar: Mathematics Education	2-3 s.h.

A minimum of two courses selected from a cognate area in education; suggested areas are educational psychology, educational statistics and measurement, elementary mathematics education, history or philosophy of education, instructional design and technology, counselor education, secondary school curriculum, secondary school administration, and special education; courses are to be selected in consultation with a faculty member from the cognate area.

Sufficient electives in mathematics and education selected with the approval of the adviser to complete 32 semester hours of credit.

Three two-hour comprehensive examinations: one in secondary mathematics education, the second in mathematics, and the third in the cognate area.

M.S. in Mathematics with Education Option

The program prepares certified teachers with advanced specialization in mathematics and mathematics education. It is especially recommended for students

considering work for the Ph.D. in mathematics education. The program is administered by the Department of Mathematics. Application should be made to that department.

Requirements

A minimum of 24 semester hours in the Department of Mathematics, including the core master's program for either pure mathematics or applied mathematics as described below.

Pure Mathematics Core:	
22M:115 Introduction to Analysis I	3 s.h.
22M:116 Introduction to Analysis II	3 s.h.
22M:120 Abstract Algebra I	3 s.h.
22M:121 Abstract Algebra II	3 s.h.
22M:132 General Topology	3 s.h.
Applied Mathematics Core:	
22M:142 Intermediate Differential Equations	3 s.h.
22M:144 Introduction to Partial Differential Equations	2-3 s.h.
22M:170 Numerical Analysis: Nonlinear Equations and Approximation Theory	3 s.h.
22M:171 Numerical Analysis: Differential Equations and Linear Algebra	3 s.h.
22M:174 Optimization Techniques	3 s.h.

Two courses in mathematics education;

Comprehensive examination of six hours over the required courses in either pure mathematics or applied mathematics, and education. The examination assesses the candidate's knowledge of mathematics and of the relevance of specific concepts relating to teaching secondary school mathematics.

Ph.D. in Mathematics Education

The program for a Ph.D. in mathematics education prepares supervisors, teacher education personnel, community college personnel, and researchers in mathematics education. It is administered by the College of Education.

The 72 semester hours include work taken toward the master's degree. Credit earned more than ten years previously must be updated. Minimum course requirements are for exceptional students. Typically, the program consists of 80-90 semester hours.

Admission

Applicants must have an undergraduate major in mathematics or the equivalent; a master's degree in mathematics, mathematics education, or education; a 3.00 grade-point average or above; and, except in unusual circumstance, a current teaching certificate and a minimum of two years of teaching experience.

Requirements

Students must complete a minimum of 36 semester hours of graduate work in the Division of Mathematical Sciences (mathematics, statistics, and computer science), including the master's-level core requirements for pure or applied mathematics described under "Master of Science in Mathematics with Education Option" in this section of the *Catalog*. Courses jointly listed in education do not fulfill this requirement. Students who have completed their mathematics requirement at another institution must complete a minimum of 6 additional semester hours of course work in mathematics at The University of Iowa, chosen with the approval of the adviser.

Also required are at least five courses in mathematics education, which must include 7S:235 Current Issues in Mathematics Education, and a minimum of two registrations in 7S:335 Seminar: Mathematics Education.

Students concentrate in two additional comprehensive examination areas in either the mathematical sciences or education. A minimum of three courses usually are required for a comprehensive examination area, but candidates should consult with appropriate faculty members in the areas selected to determine which courses they should take in order to adequately prepare for the examinations.

The statistics requirement usually is met by taking 7P:243 Intermediate Statistical Methods and 7P:246 Design of Experiments.

Students must demonstrate competence in a computer language.

Students must complete a total of at least 24 semester hours in College of Education courses; this includes the course work listed above, but does not include dissertation credit. An additional 10 semester hours of dissertation credit (7S:493) is required.

At the completion of the program, the student must have a cumulative grade-point average of 3.00 or above on all graduate work in mathematics, all University of Iowa graduate work in mathematics, all graduate work, and all University of Iowa graduate work.

Students take three written comprehensive examinations, one in mathematics education and two selected from other fields of education or mathematics; an oral examination follows the written examinations.

They also complete a dissertation on a research problem in mathematics education; a prospectus of the proposed research must be presented to the dissertation committee prior to undertaking the study; upon completion of the dissertation, an oral examination is conducted in defense of the dissertation.

M.A. in Music Education

The program provides students with deeper insights into music, the theory and practice of music education, and the role of music in the school curriculum. The degree program may be taken with thesis (30-semester-hour minimum) or without (33-semester-hour minimum).

Admission

The applicant must be a certified music teacher or in the process of completing certification requirements. An undergraduate grade-point average of 2.50, excluding grades in ensembles, is required for admission to regular status.

The program is administered by the School of Music in cooperation with the College of Education. Application is made to the School of Music.

Requirements

General:

25:321 Introduction to Graduate Study in Music	2 s.h.

Theory:

25:240 Introduction to Contemporary Analysis and Theory	3 s.h.
25:145-152 Elective	3 s.h.

Specific hour and course requirements in the theory area are determined by scores on the advisory examinations.

History and Literature:

25:301 Advanced History and Literature of Music I	3 s.h.
25:302 Advanced History and Literature of Music II	3 s.h.

Specific hour and course requirements in the history and literature area are determined by scores on the advisory examinations. Students excused from 25:301 and/or 25:302 select course(s) from music history electives. For specific courses, see "School of Music" in the College of Liberal Arts section of the *Catalog*.

Education (14-17 s.h.):

7S:144 Psychology of Music	2 s.h.
7S:149 Behavioral Research in Music	3 s.h.
7S:206 Curriculum Development in Music Education	2 s.h.
7S:240 Foundations of Music Education	2 s.h.
Electives to be selected in consultation with the adviser (may include thesis)	5-8 s.h.

Ensemble:
2 semester hours are required.

The amount of elective credit applicable toward the M.A. degree depends on scores earned on the music advisory examinations and the amount of credit earned in music education elective courses.

Master's Exam

Candidates must take a final written master's degree examination (12 semester hours) during the semester in which they expect to complete the degree. Areas of concentration covered in the examinations include music education, music theory, and music history and literature.

Ph.D. in Music Education

The program prepares students for teaching, research, or administration in the following types of positions:

- Colleges: teachers of music education classes and activities; band, chorus, and orchestra directors; and administrators of music departments and schools of music;
- Public schools: music supervisors, research and curriculum consultants, and directors of city or district school music programs.

Admission

For admission to the Ph.D. program in music education, students must have a 3.25 grade-point average on graduate work (excluding grades in ensembles), have a score above the fiftieth percentile on the verbal ability section of the Graduate Record Examination (GRE) General Test, hold or be qualified for a valid teaching certificate, and have a minimum of two years of successful music teaching experience.

In addition, the music education faculty makes an appraisal of teaching success, academic potential, and writing ability before qualifications for admission are fully determined.

The program is administered by the School of Music in cooperation with the College of Education. Application is made to the School of Music.

Requirements

The Ph.D. degree is granted on the basis of achievement, as determined by course grades and evaluations on the comprehensive and final examinations, and not on the accumulation of semester hours of credit. The course requirements and semester hours listed below are minimum requirements for the typical student in preparation for the satisfactory performance on the comprehensive and final examinations.

General (11 s.h.):

*25:321 Introduction to Graduate Study in Music	2 s.h.
25:295 Musical Acoustics	3 s.h.
*25:240 Introduction to Contemporary Analysis and Theory	3 s.h.
Elective (25:145-153)	3 s.h.

Music History and Literature (13-15 s.h.):

*25:301 Advanced History and Literature of Music I	3 s.h.
*25:302 Advanced History and Literature of Music II	3 s.h.
Elective (25:203-319)	3 s.h.
Applied and Ensembles	4 s.h.
*Electives	0-2 s.h.

Music Education (23 s.h.):

*7S:144 Psychology of Music	2 s.h.
*7S:149 Behavioral Research in Music	3 s.h.
*7S:206 Curriculum Development in Music Education	2 s.h.
*7S:240 Foundations of Music Education	2 s.h.
*Electives	3 s.h.
7S:445 Social and Psychological Factors in Music Education	3 s.h.
7S:141 Measurement and Evaluation in Music Education	3 s.h.
7S:342 Supervision and Administration in Music Education	2 s.h.
7S:279 Experimental Research in Music Education	3 s.h.

Education (8 s.h.):

7P:143 Introduction to Statistical Methods	3 s.h.
7P:242 Selected Applications of Statistical Techniques	3 s.h.
Elective	2 s.h.

*M.A.-level requirements

Students select elective courses, in consultation with their adviser, based on advisory examination scores and professional needs and goals. Subject areas include applied music, conducting, ensemble, theory, history and literature, music education, education, statistics, and psychology.

Dissertation, Comprehensive Examination

Students earn a minimum of 12 semester hours for work on a dissertation.

The comprehensive examination is an inclusive evaluation of the student's mastery of selected fields of study. Candidates must demonstrate maturity and scholarship in the areas of theory and practice of music education, research design and technique, specialized music performance, history and literature of music, and music theory and analysis.

The examination typically is divided as follows: music education theory and practice and research techniques, music theory and analysis, music history and literature, and a specialized related area.

M.A., Ph.D. in Physical Education

The Master of Arts and Doctor of Philosophy programs in physical education are described in the College of Liberal Arts section of the *Catalog*.

M.A.T. in Science Education

The M.A.T. degree program is designed for students who have an undergraduate degree in one of the sciences and few or no professional education courses. Successful completion of the program and fulfillment of the course work in science required by an endorsement program qualifies the student for an Iowa secondary teaching certificate.

The program is administered by the College of Education.

Admission

Applicants must have a bachelor's degree with a major or its equivalent in one of the sciences and a minimum undergraduate grade-point average of 3.00.

Requirements

Professional Education Sequence

Component 1:	
7S:100 Issues in Education	2 s.h.
Component 2:	
7F:180 Human Relations for the Classroom Teacher	3 s.h.
Component 3:	
7P:131 Educational Psychology	3 s.h.
Component 4:	
7S:151 Science Methods I: Elementary School Seminar and Practicum	2 s.h.
Component 5:	
7S:152 Science Methods II: Resources, Research, Teaching Strategies, and Curriculum Development for K-12 Science	3 s.h.
Component 6:	
7S:153 Science Methods III: Middle/Junior High School	2 s.h.
7S:189 Elementary School Special Subject Area Student Teaching	3 s.h.
Component 7:	
7S:187 Seminar: Curriculum and Student Teaching	3 s.h.
7S:190 Individual Projects in Laboratory Practice	3 s.h.
7S:191 Observation and Laboratory Practice in the Secondary School	3 s.h.
7S:192 Observation and Laboratory Practice in the Secondary School	6 s.h.

Components 4, 5, 6, and 7 must be taken in sequence and only one each semester. These courses are not offered summer sessions.

Science Core

97:128 Meaning of Science	2 s.h.
97:130 Science in Historical Perspective	2 s.h.
97:102 Societal and Educational Applications of Earth Sciences and Environmental Sciences	3 s.h.
or	
97:103 Societal and Educational Applications of Biological Sciences	3 s.h.
or	
97:105 Societal and Educational Applications of Physical Sciences	3 s.h.
Science electives	11 s.h.

M.S. in Science Education

This degree is designed for students who want to pursue advanced science education specialization in teaching (kindergarten through college) or in related fields such as medical education, museum programs, and

textbook editing. It is offered with or without thesis.

The program is administered by the College of Education.

Admission

Candidates must have a 2.50 undergraduate grade-point average and usually must have an undergraduate degree in one of the sciences or in science education. Applicants must have teaching certification unless they are preparing for careers in allied health, museums, or community colleges.

Requirements

A total of 32 semester hours of course work with thesis or 34 semester hours without thesis, distributed as follows.

Science Education (9 s.h.):	
7E/7S:255 Science Education: Issues, History, and Rationale	3 s.h.
7E/7S:256 Science Education and the Nature of Science	3 s.h.
7E/7S:257 Science Education: Teaching, Learning, and Curriculum Models or 7E:262 Advanced Techniques of Teaching Science in the Elementary School	3 s.h.
7E/7S:258 Science Education Research Model and Conceptual Scheme	3 s.h.
7S:350 Seminar: Science Education	0-2 s.h.
Science Specialization (17-22 s.h.):	
97:128 Meaning of Science	2-3 s.h.
Science and applied science courses selected in consultation with the adviser	15-20 s.h.
Corroborative Studies (3-6 s.h.):	
Science and applied science courses selected from an area other than the specialization	3-6 s.h.

Students take a comprehensive examination that consists of two parts: one dealing with science education, the other with the science specialization area.

Ed.S. In Science Education

The Ed.S. in Science Education is an intermediate degree between the master's and the Ph.D. degree. It is recommended for state, regional, or local science supervisors as well as for instructors in community colleges and small four-year liberal arts colleges.

The program is administered by the College of Education.

Admission

Candidates must have a 2.70 grade-point average on all undergraduate and graduate work undertaken prior to application for admission. Candidates usually are expected to have the equivalent of an undergraduate major in one of the sciences or science education.

Requirements

A minimum of 60 semester hours of course work, which must include the courses listed below; courses taken toward the requirements for a master's degree may be applied to this total.

Science Education (26 s.h.):	
7E/7S:255 Science Education: Issues, History, and Rationale	3 s.h.
7E/7S:256 Science Education and the Nature of Science	3 s.h.
7E/7S:257 Science Education: Teaching, Learning, and Curriculum Models	3 s.h.
7E/7S:258 Science Education Research Models and Conceptual Schemes	3 s.h.
*7S:355 Ph.D. Internship	2-3 s.h.
*7S:356 Science Education Internship: Teacher Education, Supervision, and Administration	1-3 s.h.
*7S:357 Science Education Internship: Teaching and Learning Strategies	1-3 s.h.
7S:350 Seminar: Science Education	0-2 s.h.
Total	26 s.h.

*May be repeated

Science Specialization (24 s.h.):
Courses that supplement undergraduate preparation, chosen from regular graduate offerings in biochemistry, botany, chemistry, environmental studies, geology, microbiology, physics, radiation research, and zoology; should include a concentration of 15 semester hours in at least one field of science.

Corroborative Studies (8 s.h.):
An integrated group of supporting courses selected from a limited number of areas such as education, applied science, science, and history/philosophy of science, in consultation with the adviser

A special research or curriculum development project is required, resulting in a written report suitable for publication. Four semester hours of credit are assigned for this research.

Students take a comprehensive examination that consists of three parts: one dealing with science education, another with an area of science, and a third with the corroborative studies area.

Ph.D. In Science Education

This degree is appropriate for qualified candidates who aspire to college and university positions as science educators; major supervisory posts in national, state, and local systems; teaching positions in the sciences at small liberal arts colleges; positions as instructors of general education science courses and areas at major colleges; positions as research directors in science education; and positions in medical education.

The program is administered by the College of Education.

Admission

Candidates must meet the minimum admission standards of the Graduate College. Usually applicants must have completed a master's degree in one of the sciences or science education and have earned a 3.00 grade-point average on all graduate work taken prior to making the application.

Requirements

A minimum of 102 semester hours of course work, which must include the courses listed below; courses taken toward a master's degree count toward this total.

7E/7S:255 Science Education: Issues, History, and Rationale	3 s.h.
7E/7S:256 Science Education and the Nature of Science	3 s.h.
7E/7S:257 Science Education: Teaching, Learning, and Curriculum Models	3 s.h.
7E:262 Advanced Techniques of Teaching Science in the Elementary School	3 s.h.
7E/7S:258 Science Education Research Models and Conceptual Schemes	3 s.h.
7S:350 Seminar: Science Education	0-2 s.h.
*7S:355 Ph.D. Internship	2-3 s.h.
*7S:356 Science Education Internship: Teacher Education, Supervision, and Administration	1-3 s.h.
*7S:357 Science Education Internship: Teaching and Learning Strategies	1-3 s.h.
7S:368 Seminar: Current Research in Science Education	1-3 s.h.
Total	26 s.h.

*May be repeated.

Candidates must complete 28 semester hours of credit in one of the following as the major area of study: biological science, physical science, earth science, or environmental studies.

They also complete 8 semester hours in an integrated group of supporting courses selected from a limited number of areas such as education, applied science, science, and history/philosophy of science, in consultation with the adviser.

Candidates must demonstrate competency in two of the following research tool areas: statistics, computer programming and/or data processing, research design (completion of a pilot study), foreign language (French, German, Russian, or Chinese). Competency is certified by the adviser.

Candidates for the degree usually are expected to participate in the teaching and research function of the science education program throughout their residence.

Candidates complete 10 semester hours of dissertation credit (7E/7S:493).

The comprehensive examination consists of three parts: one dealing with science education, another with an area of science, and a third with the corroborative studies area.

M.A. in Social Studies Education

The program provides an opportunity for interdisciplinary work in history, social science, or related areas for classroom teachers, high school department chairs, and supervisors, as well as others interested in acquiring greater competence in the social sciences and greater proficiency in teaching and supervision.

Students may choose from two programs in social studies education. Program A provides an opportunity for interdisciplinary work in history, social science, or related areas for classroom teachers or others interested in acquiring greater competence in their subject matter area. Program B is for individuals who have their bachelor's degree in history or social sciences and wish to obtain a teaching certificate in the process of completing the master's degree.

Admission

Applicants must have a bachelor's degree in history or one of the other social sciences from an accredited institution; a cumulative grade-point average of 3.00; a 3.00 grade-point average in history and/or other social science courses; preferred composite Graduate Record Examination (GRE) General Test score of 1000 on the verbal and quantitative batteries; and two letters of recommendation. Evidence of writing ability in the form of a completed major paper or essay also is required. Typically, applicants to Program A are expected to hold a secondary teaching certificate.

After declaring a social studies education major, the M.A. candidate must maintain at least a 3.00 grade-point average.

Program A Requirements

Program A students must complete 38 semester hours distributed among history, social sciences, or related areas, with a minimum of 10 semester hours in each of three fields.

Nine of the total 38 semester hours must consist of graduate courses numbered 200 or above distributed among the fields selected for concentration.

If the thesis option is selected, the student completes a research or investigative problem in history or social sciences, or in related areas, in which case the thesis director is a member of the appropriate department; or an investigative problem in social studies education, in which case the thesis director is a faculty member in the College of Education.

A two-hour written examination is required in each of the three fields selected for concentration. An oral examination follows the written examination, conducted by the candidate's committee as a whole.

Program B Requirements

Program B students must complete a total of 38-48 semester hours, consisting of the courses listed below. All of the following courses must be completed, but students may elect to take some of the course work in the process of completing the bachelor's degree. In such cases, the number of hours is reduced accordingly, but in no case is the number of hours in the master's degree program to be less than 38. In all instances, the student must take appropriate work for meeting all Iowa Department of Education requirements for teacher certification.

Professional Education Courses:	
7S:100 Issues in Education	2 s.h.
7P:131 Educational Psychology	3 s.h.
7F:180 Human Relations for the Classroom Teacher	3 s.h.
7W:120 Introduction to Instructional Design and Technology	3 s.h.
7S:170 Methods: Social Studies	3 s.h.
7F:117 Philosophies of Education or 7F:130 Educational Sociology	3 s.h.
7S:277 Seminar: Social Studies Education	3 s.h.
7S:191 Observation and Laboratory Practice in the Secondary School	6 s.h.
7S:192 Observation and Laboratory Practice in the Secondary School	6 s.h.

Candidates also are required to register for a practicum in a public school.

Subject Area Specialization Courses: Fifteen semester hours of course work in one or two history or other social science fields to be selected in consultation with the adviser

Comprehensive Examination

The comprehensive examination consists of three parts: a two-hour examination in the subject area specialization, a two-hour examination in general professional education, and a two-hour examination in social studies education.

Ph.D. in Social Studies Education

This program is administered by the College of Education. It prepares secondary chairs, supervisors, curriculum directors, teacher education personnel, and college instructors in the social sciences and pedagogy.

Admission

Applicants must have a bachelor's degree in history or the social sciences, and a master's degree in history, the social sciences, or education. They must satisfy the requirements for admission to a doctoral program in the Graduate College and have a grade-point average of 3.00 or above. A minimum Graduate Record Examination (GRE) General Test score of 1200 (composite of verbal and quantitative) is preferred. Seminar papers or field research are required as equivalent if no thesis was written as part of the M.A. An interview is required prior to regular admission.

Requirements

Students must complete a minimum of 90 semester hours of course work and dissertation credit beyond the bachelor's degree, not including tool requirements. The 90 semester hours must be distributed among history, social sciences or related areas, and professional education, depending on the background and goals of the candidate.

Seminars and courses numbered 200 or above are required in each of the areas of study constituting the major. A minimum of 2-3 semester hours of 98:201, 98:202, or 7S:293 must be completed with one of the faculty members in social studies education, unless other course work with these faculty members has been completed.

Tool requirements are tailored to the individual's program and may consist of foreign languages or other requirements. Usually, statistics plus research techniques in one or more of the chosen fields or in a language is required.

Comprehensive Examinations

Students take three three-hour examinations, one in each of the areas of study. Depending on the distribution of work taken, the nine hours of written examinations may be rearranged.

The Ph.D. examining committee consists of a minimum of one faculty member from the liberal arts disciplines and one from social studies education. The remaining members (to make the minimum of five as required by the Graduate College) are selected with regard to the nature of the student's Ph.D. program and distribution of course work. An oral examination is conducted by the committee as a whole following the written examination.

Alternatives to the traditional written comprehensive examination may be considered by the candidate's committee.

Dissertation

A dissertation is required on a research problem in history or the social sciences, or in related areas, in which case the dissertation director will be a faculty member of the appropriate department, or on a research problem in social studies education, in which case the dissertation director will be a faculty member of the College of Education. The candidate must present a prospectus of the proposed research to the dissertation committee prior to undertaking the study. Upon completion, an oral examination is conducted in defense of the dissertation.

Continuing requirements for maintaining candidacy are a grade-point average of 3.00 plus annual reevaluation.

Special Education

The division offers special education programs in these primary areas: mental retardation; learning disabilities; behavior disorders; early childhood special education; and moderate, severe, and

profound mental disabilities. These programs are designed to prepare graduates for positions in public schools, local and state education agencies, clinical settings, and institutions of higher education. Most programs are approved by the Iowa Department of Education (approval for one is pending). Programs leading to special education certification are not available to undergraduates. Undergraduates who wish to pursue a career in special education are encouraged to contact the Division of Curriculum and Instruction for advisement.

Admission

Admission requirements include:

- Completed graduate application form;
- Copies of official transcripts for all previous college course work;
- Official report of the Graduate Record Examination (GRE) General Test, verbal and quantitative;
- Three current letters of recommendation; and
- Evidence of experience or teacher certification (varies depending on program).

An interview may be requested. In addition to the above, the following represent minimum requirements.

Master of Arts: An undergraduate grade-point average of 2.75 (or 3.00 on at least 12 semester hours of graduate course work) and a combined verbal and quantitative GRE score of 1000.

Specialist in Education: A graduate grade-point average of 3.25 and a combined verbal and quantitative GRE score of 1000.

Doctor of Philosophy: An undergraduate grade-point average of 3.00 or a graduate grade-point average of 3.50 if a graduate degree has been conferred, and a combined verbal and quantitative GRE score of 1000. For students without an M.A. thesis, an equivalent project must be completed.

Final admission decisions are made by the division admission committee and are based on a composite analysis of the candidate's likelihood for success in the division. This analysis may include consideration of available resources, comparative standing, and specific program requirements (related primarily to certification standards).

Applications must be complete to be reviewed. It is the candidate's responsibility to provide a completed admissions dossier. Students may be admitted for any session.

Master of Arts

The purpose of the graduate programs in special education is to prepare persons to deliver appropriate levels of service to students with disabilities at the preschool, elementary, and secondary levels in either public or private settings. Special education certification requires that students already be eligible for either elementary or secondary certification. Students who do not seek certification may be admitted selectively to the M.A. program.

The program requires a minimum of 38 semester hours.

Admission

Admission requirements are:

- A completed graduate application form;
- Copies of official transcripts for all previous college course work;
- An official report of the Graduate Record Examination (GRE) General Test, verbal and quantitative, with a score of at least 1000;
- Three current letters of recommendation;
- Evidence of experience in regular or special education (see each program for specific requirements); and
- An undergraduate grade-point average of at least 2.75 (or 3.00 on at least 12 semester hours of graduate course work).

An interview may be requested.

Program Core

Special education core requirements for all programs include:

7U:130 Exceptional Persons	3 s.h.
7U:134 Parent-Teacher Communication	3 s.h.
7U:206 Practicum with Exceptional Persons	3 s.h.
7U:238 Assessment of Learning Difficulties	1-3 s.h.

Program Specializations

Learning Disabilities

A core of courses in learning disabilities (LD) is required for all students. It includes:

7U:131 Introduction to Learning Disabilities	3 s.h.
7U:207 Supervised Teaching with Learning Disabled	5 s.h.
7U:209 Seminar: Graduate Supervised Teaching	1 s.h.

Students seeking an elementary (K-6) LD teaching certificate must obtain (or already have) a regular elementary teaching certificate. The following courses also are required:

7E:171 Reading Clinic: Teaching Techniques	2-3 s.h.
7E:172 Reading Clinic: Teaching Practicum	2-3 s.h.
7E:173 Teaching Elementary School Mathematics	2-3 s.h.
7U:201 Methods: Children with Learning Disabilities	3 s.h.
Total	30-33 s.h.

Students seeking a secondary (7-12) LD teaching certificate must obtain (or already have) a regular elementary teaching certificate. The following courses also are required:

7U:121 Career Education and Transition	3 s.h.
7E:173 Teaching Elementary School Mathematics	3 s.h.
7S:194 Methods: High School Reading	2-3 s.h.
or	
7S:195 Developing Reading Skills in the Secondary Schools	2-3 s.h.
7U:203 Methods: Adolescents with Learning Disabilities	3 s.h.
Total	32-33 s.h.

The remainder of the required 38 semester hours are elective courses chosen by the student and the academic adviser.

Behavior Disorders

A core of courses in behavior disorders (BD) is required for all students. It includes:

7U:132 Introduction to Behavioral Disorders	3 s.h.
7U:210 Characteristics and Programs: Persons with Severe Behavioral Disorders	2 s.h.
7U:211 Interventions: Persons with Severe Behavioral Disorders	2 s.h.
7U:240 Behavioral Principles	1-3 s.h.
7U:208 Supervised Teaching with Behavior Disordered	5 s.h.
7U:209 Seminar: Graduate Supervised Teaching	1 s.h.

Students seeking an elementary (K-6) BD teaching certificate must obtain (or already have) a regular elementary teaching certificate. The following courses also are required:

7U:202 Methods: Children with Behavioral Disabilities	3 s.h.
Total	31 s.h.

Students seeking a secondary (7-12) BD teaching certificate must obtain (or already have) a regular secondary teaching certificate. The following courses also are required:

7U:204 Methods: Adolescents with Behavioral Disorders	3 s.h.
7U:121 Career Education and Transition	3 s.h.
Total	34 s.h.

Students completing an M.A. degree also must complete the following.

7U:206 Practicum with Exceptional Persons (either autism or severe behavior disorders)	2 s.h.
7U:212 Characteristics and Programs: Persons with Autism	2 s.h.
7U:213 Interventions: Persons with Autism	2 s.h.
7U:252 Seminar: Behavior Assessment and Evaluation	3 s.h.

Mental Retardation—Mild/Moderate

A core of courses in mental retardation (MD) is required for all students. It includes:

7U:135 Mental Retardation	3 s.h.
7U:240 Behavioral Principles	1-3 s.h.
7U:242 Methods: Moderate/Severe/Profound	3 s.h.
7U:209 Seminar: Graduate Supervised Teaching	1 s.h.
7U:220 Supervised Teaching with Mild Mentally Retarded	3 s.h.

7U:244 Supervised Teaching: Moderate Mentally Retarded	3 s.h.

Students seeking an elementary (K-6) MD approval must obtain (or already have) a regular elementary teaching certificate. The following courses also are required:

7U:214 Methods: Children with Mild Mental Retardation	3 s.h.
Total	26-30 s.h.

Students seeking a secondary (7-12) MD teaching certificate must obtain (or already have) a regular secondary teaching certificate. The following courses also are required:

7U:133 The Culturally Different in Diverse Settings	3 s.h.
7U:215 Methods: Adolescents with Mild Mental Retardation	3 s.h.
7E:173 Teaching Elementary School Mathematics	2-3 s.h.
7S:194 Methods: High School Reading	2-3 s.h.
or	
7S:195 Developing Reading Skills in the Secondary School	2-3 s.h.
7U:121 Career Education and Transition	3 s.h.
Total	40-42 s.h.

The remainder of the required 38 semester hours are elective courses chosen by the student and the academic adviser. Students who meet the requirements for certification in the area of Elementary Mental Retardation—Mild/Moderate can meet the requirements for endorsement in the area of Physically Handicapped (K-6) by completing the following courses.

3:15 Introduction to Speech and Hearing Processes and Disorders	3 s.h.
7U:138 Methods: Children with Physical Disabilities	3 s.h.
7U:139 Orientation to the Rehabilitation of the Physically Handicapped Child	3 s.h.
7U:191 Supervised Teaching with Physically Handicapped	5 s.h.

Early Childhood Special Education

Prior teaching certification is desirable but not required for admission to the early childhood special education certification program. Applicants who do not already have certification must complete an additional 11 semester hours of professional education course work, as follows.

7E:100 Introduction: Elementary and Early Childhood Teaching	3 s.h.
7P:75 Educational Psychology and Measurement	3 s.h.
7F:180 Human Relations for the Classroom Teacher	3 s.h.
7W:91 Audiovisual Equipment for Instruction	1 s.h.
7W:92 Introduction to Microcomputing for Teachers	1 s.h.

The following courses, in addition to the above core requirements, form the program of study for Early Childhood Special Education.

7U:117 Interdisciplinary Programming for Disabled	3 s.h.
7U:271 Assessment of Young Children with Disabilities	2 s.h.
7U:272 Development of Young Children with Disabilities	2 s.h.
7U:273 Teaching Early Childhood Special Education Ages 0-3	3 s.h.
7U:274 Teaching Early Childhood Special Education Ages 3-6	3 s.h.
7U:275 Families of Young Children with Disabilities	3 s.h.
3:118 Language Development	3 s.h.
3:140 Manual Communication I	1 s.h.
7U:276 Supervised Teaching: Early Childhood Special Education I (1/2 semester, 1/2 time in a center-based program)	3 s.h.
7U:277 Supervised Teaching: Early Childhood Special Education II (1/2 semester, 1/2 time in a home-based program)	3 s.h.
7U:278 Seminar: Teaching Early Childhood Special Education	1 s.h.
Cardiopulmonary resuscitation course	0 s.h.
Total	27 s.h.

The remainder of the required 38 semester hours are elective courses chosen by the student and the academic adviser.

Moderate/Severe/Profound Mental Disabilities

Prior teaching certification is desirable but not required for admission to the moderate/severe/profound mental disabilities certification program. Applicants who do not have prior certification must complete an 11-semester-hour professional education core as follows:

7E:100 Introduction: Elementary and Early Childhood Teaching	3 s.h.
7P:75 Educational Psychology and Measurement	3 s.h.
7F:180 Human Relations for the Classroom Teacher	3 s.h.
7W:91 Audiovisual Equipment for Instruction	1 s.h.
7W:92 Introduction to Microcomputing for Teachers	1 s.h.

The following courses, in addition to the core requirements, form the program of study for moderate/severe/profound mental disabilities.

7U:117 Interdisciplinary Programming for Disabled	3 s.h.
7U:240 Behavioral Principles	2-3 s.h.
7U:241 Methods: Persons with Moderate/Severe/Profound Mental Disabilities I	3 s.h.
7U:242 Methods: Persons with Moderate/Severe/Profound Mental Disabilities II	3 s.h.
7U:243 Issues: Teaching Moderate/Severe/Profound	3 s.h.
7U:244 Supervised Teaching: Moderate Mentally Retarded (1/2 semester, 1/2 time)	3 s.h.
7U:245 Supervised Teaching: Severe/Profound (1/2 semester, 1/2 time)	3 s.h.
7U:246 Seminar: Teaching Moderate/Severe/Profound	1 s.h.
Cardiopulmonary resuscitation course	0 s.h.
Total	21 s.h.

The remainder of the required 38 semester hours are elective courses chosen by the student and the academic adviser.

Multicategorical Resource—Mildly Handicapped

A core of courses is required for all students. It includes:

7U:117 Interdisciplinary Programs for Disabled	3 s.h.
7U:222 Supervised Teaching in Resource Programs	5 s.h.
7U:209 Seminar: Graduate Supervised Teaching	1 s.h.

At least two of the following:

7U:131 Introduction to Learning Disabilities	3 s.h.
7U:132 Introduction to Behavioral Disorders	3 s.h.
7U:135 Mental Retardation	3 s.h.

Students seeking an elementary (K-6) multicategorical resource teaching certificate must obtain (or already have) a regular elementary teaching certificate. The following courses also are required:

7U:216 Methods: Elementary Resource Teaching	3 s.h.
7E:171 Reading Clinic: Teaching Techniques	2-3 s.h.
7E:172 Reading Clinic: Teaching Practicum	2-3 s.h.
7E:173 Teaching Elementary School Mathematics	2-3 s.h.
7U:202 Methods: Children with Behavioral Disorders	3 s.h.
Total	39-42 s.h.

Students seeking a secondary (7-12) multicategorical resource teaching certificate must obtain (or already have) a regular secondary teaching certificate. The following courses also are required:

7U:121 Career Education and Transition	3 s.h.
7E:173 Teaching Elementary School Mathematics	2-3 s.h.
7S:194 Methods: High School Reading	2-3 s.h.
or	
7S:195 Developing Reading Skills in the Secondary School	2-3 s.h.
7U:204 Methods: Adolescents with Behavioral Disorders	3 s.h.
7U:217 Methods: Secondary Resource Teaching	3 s.h.
Total	38-42 s.h.

Multicategorical Special Class with Integration

Requirements include the core courses from two of the following programs: learning disabilities, behavior disorders, or mental retardation.

For students seeking elementary (K-6) approval, the courses required at the elementary level in the two programs chosen above also must be completed.

For students seeking secondary (7-12) approval, the courses required at the secondary level in the two programs chosen above also must be completed.

Specialist in Education

The program provides advanced graduate training for professionals in the field of special education. Included are individuals in consultation, supervisory work, and work-study coordination in special education.

In addition to the general graduate admission requirements listed below, requirements for admission to this program include a master's degree in special education or equivalent; preparation and certification in special education; and a minimum of one year of full-time teaching experience prior to admission to the program.

The program requires a minimum of 60 semester hours. The flexible plan of study is developed by the student and adviser. Degree requirements include written comprehensive examinations and a research paper (7U:395 Educational Specialist Research, 4 semester hours).

Ed.S. in Special Education Administration

The Ed.S. in Special Education Administration is offered jointly with the Division of Educational Administration.

Its primary objective is to provide sufficient training and experience to enable graduates to obtain entry-level positions in administration. The career focus of the program is on middle management positions such as supervisors and assistant directors. Successful completion of the program qualifies students for certification in Iowa to serve as directors of special education (State of Iowa Endorsement 239) and for certification in general school administration (State of Iowa Endorsement 171).

The program requires a minimum of 60 semester hours of credit.

Admission to the program is limited by available resources. Five to eight new students are admitted each year. Admission requirements include a master's degree and certification in some area of teaching exceptional children, and classroom experience as a teacher or equivalent experience.

Doctor of Philosophy

The Ph.D. program in special education prepares students for positions in higher education research and teaching, and for curriculum, supervisory, research, and administrative positions in state and local education agencies. The program permits students to study and practice extensively in their area of interest in special education.

Admission requirements for the Ph.D program include a master's degree or equivalent and a minimum of one year of full-time teaching experience with exceptional children. The admissions committee gives preference to applicants who have had several years of experience.

The program requires a minimum of 90 semester hours. The plan of study is flexible and varies depending on the student's background and educational goals. In general, students are expected to possess a general background in all facets of special education and one or two areas of specialization. The actual course of study is developed by the student and the academic adviser. Students are required to write comprehensive examinations and complete a doctoral dissertation (7U:493 Ph.D. Thesis in Special Education, 10 semester hours minimum).

Facilities

Special facilities available to students in special education include the University Hospital School, for mentally and physically disabled, and the University Psychiatric Hospital/Child Psychiatry Program, for children and youth with behavioral disorders.

Courses

Early Childhood and Elementary Education

7E:71 Human Growth and Motor Development 2 s.h.
Theoretical bases for elementary physical education, including growth and development of the human nervous and musculoskeletal systems; motor development from birth through puberty—locomotion, reaching and grasping, visual/motor coordination, development of basic skills. Open only to physical education majors and candidates for the Coaching Endorsement who have been accepted into a teacher education program. Same as 138:71.

7E:72 Methods and Materials in Elementary Physical Education (Practicum—Elementary School) 3 s.h.
Practical considerations and curriculum planning for prospective teachers of elementary school physical education. Open only to physical education TEP majors. Offered spring semesters. Prerequisites: 7E:71 or 138:71, and 7S:97.

7E:78 Beginning Folk Guitar 2 s.h.
Development of guitar and basic music skills. Consent of instructor required. Same as 25:78.

7E:91 Pre-Education Practicum, Elementary Education 2 s.h.
Students spend six hours per week working with children and teachers in elementary schools; assignments to schools are made in 7E:100. Admission to elementary TEP required. Corequisite: 7E:100.

7E:92 Pre-Education Practicum, Prekindergarten 1 s.h.
Students spend one half-day per week working with children and teachers in a prekindergarten setting; assignments to centers are made in 7E:158. Admission to elementary TEP required. Corequisite: 7E:158.

7E:93 Pre-Education Practicum, Kindergarten and Early Elementary 1 s.h.
Students spend two half-days per week for eight weeks working with children and teachers in a K-2 setting; assignments to schools are made in 7E:167. Admission to elementary TEP required. Corequisite: 7E:167.

7E:100 Introduction: Elementary and Early Childhood Teaching 3 s.h.
Overview of elementary and early childhood education; history and philosophy, general organizational patterns, financial and legal concerns, and political and social issues. Admission to elementary TEP required. Corequisite: 7E:91.

7E:101 Introduction to Education 3 s.h.
Basic orientation to the field of education; administrative organization, instructional procedures, and contemporary problems at both elementary and secondary levels. Same as 7S:101.

7E:103 Administration of Physical Education and Athletics 2-3 s.h.
Administrative issues in both physical education and athletics; topics include theory, budgeting practices, legal liability, public relations, and evaluation of personnel. Same as 7S:103, 138:103.

7E:104 Remedial Methods in Speech and Hearing 2 s.h.
Emphasis on elementary grades. Usually taken in conjunction with 7E:192, which provides approximately 70 hours of supervised clinical practice in elementary schools. Primarily for speech pathology and audiology majors. Consent of instructor required.

7E:120 Methods and Materials: Music for the Classroom Teacher 2-3 s.h.
Development of music skills, techniques, and knowledge of methods and materials for teaching music to young children; for elementary education majors. Admission to TEP required.

7E:122 Methods and Materials: Art for the Classroom Teacher 2-3 s.h.
Projects, techniques, and processes in art for elementary and early childhood education majors; combination lecture and studio; painting, drawing, printmaking, sculpture, and crafts with materials and tools commonly available in the elementary schools. Same as 1E:195.

7E:123 Literature for Children I 2-3 s.h.
General survey of literature intended for children; discussion of children's interests, capabilities, and reading programs; history and criticism of books for children; illustrations in books and recent trends and issues in literature. Admission to elementary TEP or consent of instructor required. Corequisites: 7E:160 and 7E:164.

7E:124 Reading Children's Classics and Award Books 3 s.h.
Evaluation and utilization of classic and award books for children, ages 4-14; research pertaining to children's responses to these literary selections.

7E:125 Methods and Materials of Teaching Children's Dance 2-3 s.h.
Presenting creative movement experiences for the elementary school child. Same as 137:111.

7E:126 Literature and Storytelling for Children 3 s.h.
Rationale, materials, and techniques for sharing stories with young people; comparison and evaluation of variant texts in book and audiovisual versions; selecting stories for audiences of different ages; planning story programs; performance techniques. Same as 21:126.

7E:127 Methods and Materials: Physical Education for the Elementary Teacher 2 s.h.
Methods and curriculum in elementary physical education for the classroom teacher.

7E:128 Methods and Materials: Health Education for the Elementary Teacher 2 s.h.
Principles and practices of healthful living; teaching methodologies and materials development for the elementary classroom teacher.

7E:134 Parent-Teacher Communication 1-3 s.h.
Realities of working with parents; interpersonal skills; options for parent support services. Same as 7P:134, 7U:134.

7E:137 Physical Education Curriculum: Issues and Trends 3 s.h.
Strategies for the K-12 setting. Same as 27:137, 7S:137.

7E:138 Special Education for Early Childhood Teachers 2-3 s.h.
Theory and recommended practices for mainstreaming children with handicapping conditions in early childhood classrooms. Prerequisite: 7E:157 or consent of instructor.

7E:142 Assessment of the Bilingual Child 2-3 s.h.
Language and psychoeducational development of the bilingual child, issues in assessment and evaluation, and educational implications of bilingualism.

7E:143 Methods: Art 3 s.h.
Application of studio methods to teaching children in Saturday Children's Art Class program. Prerequisite: 1E:196.

7E:144 Methods and Materials: Elementary School Instrumental Music 2 s.h.
Materials, techniques, and methods for teaching band and orchestra instruments in the elementary school.

7E:145 Methods and Materials: Elementary School General Music 3 s.h.
Area of specialization in music for choral music education students and elementary education majors. Offered spring semesters.

7E:155 Methods: Reading in Bilingual and ESL Programs 3 s.h.
Reading problems faced by students with limited English proficiency; instruction in teaching reading in both English and Spanish in accordance with bilingual education theory and methodology.

7E:157 Methods: Early Childhood Education I 3 s.h.
Current educational literature in all curricular areas; emphasis on application of educational theory and instructional materials in prekindergarten care and education. Admission to TEP required.

7E:158 Guidance of Young Children (3-6 Years) 3 s.h.
Techniques of preventing behavior problems in child care programs; behavior management; cognitive approaches to encouraging social and moral development of children; three hours of observation weekly of caregivers and children in local child care centers.

7E:159 Early Childhood Education Special Projects 1-3 s.h.
Curriculum, methodology, and materials; specific content varies with current issues, developments, needs of students; for prekindergarten, kindergarten, and primary teachers, supervisors, and consultants. May be repeated.

7E:160 Methods: Elementary School Language Arts 3 s.h.
Planning processes and development of problem method teaching units; approaches to personal self-expression through oral, written, and visual modes (creative dramatics, writing, film, etc.), and to language development, concepts concerning language, and skills of oral and written communication. Admission to elementary TEP required. Corequisite: 7E:123 and 7E:164.

7E:161 Methods: Elementary School Social Studies 2 s.h.
Objectives and content for grades K-6; development of work study skills and problem method. Admission to elementary TEP required. Corequisites: 7E:162, 7E:163, and 7E:166.

7E:162 Methods: Elementary School Science 2 s.h.
Principles and concepts of science instruction in elementary school for preservice instruction of elementary education majors; emphasis on techniques that characterize new approaches to science. Admission to elementary TEP required. Corequisites: 7E:161, 7E:163, and 7E:166.

7E:163 Methods: Elementary School Mathematics 2 s.h.
Methods used in kindergarten and grades 1-6; teaching number system and arithmetic operations. Admission to TEP required. Corequisites: 7E:161, 7E:162, and 7E:166.

7E:164 Methods: Elementary School Reading 3 s.h.
Basic methods, trends, recent materials, and crucial issues in reading programs of kindergarten, primary, and upper elementary grades. Admission to elementary TEP required. Corequisites: 7E:123 and 7E:160.

7E:165 Methods: Multicultural-Bilingual Education 3 s.h.
Methods of instruction for multicultural and bilingual settings in grades K-6; emphasis on cognitive and affective areas of the teaching process, including curriculum and resource development and teaching strategies.

7E:166 Mathematics-Sciences Practicum 1 s.h.
Practicum at the K-6 level involving mathematics, science, and social science content areas; scheduling done in the related methods courses. Corequisites: 7E:161, 7E:162, and 7E:163.

7E:167 Methods: Early Childhood Education II 3 s.h.
Current educational literature in all curricular areas; emphasis on application of educational theory and on instructional materials for K-2. Corequisite: 7E:93.

7E:169 History and Philosophy of Early Childhood Education 2-3 s.h.
Historical and philosophical foundations.

7E:170 Classroom Management 1-3 s.h.
Activities, techniques, strategies, and theories related to effective classroom management. May be repeated.

7E:171 Reading Clinic: Teaching Techniques 2-3 s.h.
Diagnostic and prescriptive teaching techniques and differential reading curricula for children at all levels of reading ability. Prerequisite: 7E:164, 7P:170, or 7S:194. Corequisite: 7E:172.

7E:172 Reading Clinic: Teaching Practicum 2-3 s.h.
Practice in application of diagnostic teaching techniques and reading curriculum development. Prerequisite: 7E:164, 7P:170, or 7S:194. Corequisite: 7E:171.

7E:173 Teaching Elementary School Mathematics 2-3 s.h.
Study of the elementary school mathematics curriculum; emphasis on accommodating varied children's ability levels, diagnosing pupil errors, testing, developing instructional sequences, remediation and enrichment, and selected research results.

7E:174 Diagnostic and Prescriptive Approaches to Reading Instruction K-12 1-4 s.h.
Changing purposes and techniques for assessing reading strengths and weaknesses; corresponding changes in instructional goals as children progress through the reading curriculum. May be repeated. Prerequisite: 7E:164 or 7P:170.

7E:175 Developing Communication Skills 3 s.h.
Development of communication skills through oral, written, and visual/nonverbal modes to meet a range of purposes, situations, and audiences; direct and incidental methods of instruction in skills; ways to develop language across the curriculum; assessment of instructional materials and learning activities and evaluation instruments for communication skills.

7E:176 Teaching Elementary School Reading 3 s.h.
Elementary school reading curriculum; emphasis on adapting various methodologies to individual pupil needs; enrichment activities, classroom diagnosis, comprehension techniques, and other practical classroom activities.

7E:177 Workshop: Curriculum Evaluation and Selection 1-3 s.h.
For a specific curricular area, choosing or developing criteria for evaluating, reviewing, selecting, and organizing materials and activities to suit specific curricular patterns. May be repeated for different areas (see current *Schedule of Courses* for specific areas offered).

7E:178 Workshop: Curriculum Development and Implementation 1-4 s.h.
For a specific curricular area; determining curricular needs and applying educational principles and research to developing materials and activities that suit specific curricular patterns. May be repeated for different areas (see current *Schedule of Courses* for specific areas offered).

7E:179 Workshop: Teaching Methodology 1-3 s.h.
For a specific curricular area; review of teaching methods, theory, related research; planning and developing lessons; demonstrations, observations, or simulations of teaching. May be repeated for different areas (see current *Schedule of Courses* for specific areas offered).

7E:180 Creative Drama in the Classroom 3 s.h.
Explores values of creative drama, familiarizes students with creative dramatics activities, develops ability to plan drama experiences, and provides guided experiences in leader techniques; includes a seven-session classroom practicum; for students in education, communication studies, theatre arts, recreation, and so forth.

7E:181 Piaget in the Classroom 2-4 s.h.
Development of logical thought in the concrete- and formal-operational stages; emphasis on learning numerous Piaget-type tasks, presenting these tasks to children, deriving classroom implications from the data; primarily for experienced teachers.

7E:182 Language and Learning 2-3 s.h.
How language growth reflects and enables cognitive development; readings in psychology, anthropology, and education; relationship of language theory to language instruction in schools. Same as 7S:182, 8P:182.

7E:184 Piaget for Teachers 3 s.h.
Specific classroom procedures and determination of appropriate content topics for various grade levels; for teachers interested in examining and implementing the work of Jean Piaget in their classrooms.

7E:186 Curriculum Foundations 2-3 s.h.
Elementary and secondary background developments in curriculum; definitions, historical perspective, philosophies, theories of knowledge, models, learning theories, directions of development and shaping forces; product oriented. Same as 7S:186.

7E:188 Practicum in Teaching and Curriculum Development in Gifted Education 1-6 s.h.
Includes experience in developing course materials for classes offered through the Belin Center. Same as 7C:188, 7S:188, 7U:188.

7E:189 Development and Administration of Child Care Centers 3 s.h.
Topics in starting and managing a child care center; licensing, budgeting, health and safety, parent involvement, supervising staff, maintaining quality; students visit and evaluate a child care center.

7E:190 Supervised Teaching in the Elementary School: Interactive Phase arr.
Student teaching at the elementary level (K-9). Application to the College of Education Office of Student Personnel required. Corequisite: 7E:191.

7E:191 Supervised Teaching Elementary School Pre- and Post-Active Phase arr.
Application to the College of Education Office of Student Personnel required. Corequisite: 7E:190.

7E:192 Special Area Student Teaching arr.
Supervised teaching and observation in specific areas of elementary curriculum (see current *Schedule of Courses* for specific areas offered). Consent of instructor required.

7E:193 Independent Study arr.
Open only to seniors. Consent of instructor required.

7E:195 Multicultural Concepts and Educational Systems 3 s.h.
In-depth examination of educational practices within various communities, both international and local; educational perceptions of these multicultural communities; perceptions of the educational institutions that serve them.

7E:196 Bilingual Lab Practicum in Elementary Schools 3 s.h.
Practical approach to dual language instruction with students in small classes where bilingual and English as a second language (ESL) methodology is employed.

7E:197 Supervised Teaching Early Childhood Center: Interactive Phase arr.
Student teaching in prekindergarten early childhood centers. Application to the College of Education Office of Student Personnel required. Corequisite: 7E:198.

7E:198 Supervised Teaching Early Childhood Center Pre- and Post-Active Phase arr.
Application to the College of Education Office of Student Personnel required. Corequisite: 7E:197.

7E:204 Literature for Children II 3 s.h.
Analysis and selection of current literature for programs in a variety of settings; appropriate methods, research techniques, and multimedia approaches to promote pleasure and insight through prose and poetry. Prerequisite: 7E:123 or consent of instructor.

7E:206 Curriculum Development in Music Education 2 s.h.
Curriculum development, instructional materials, analyses of current teaching methods and techniques in school music programs. Same as 7S:206.

7E:237 Public School Curriculum in Physical Education 2-3 s.h.
Treatment of major social, psychological, and biological factors that influence curriculum approaches in physical education; emphasis on current trends; investigative or creative project required. Same as 27:237, 7S:345.

7E:242 Supervision of Physical Education 3 s.h.
Primarily for administrators, experienced teachers, and graduate students in the field of administration and supervision; major topics include program supervision and evaluation, procedures for supervision and evaluation of

teachers, and analysis of teaching methodology. Same as 27:242, 7S:242.

7E:249 Research-Based Instruction in Science 2 s.h.
Students research student explanations related to topics common to science curricula, analyze the explanations in terms of accepted scientific models, and design instructional materials and strategies for the classroom; designed for the National Science Foundation program, "Science Teacher As Action Researcher" (STAAR). Same as 7S:249.

7E:250 Program and Research Problems in Science Education 2 s.h.
Program and research problem identification; group involvement in preparing solutions; potential external funding sources. Same as 7S:250.

7E:255 Science Education: Issues, History, and Rationale 2-3 s.h.
Critical analysis of research reports, philosophical statements, synthesis studies, and issue statements that characterize graduate study in science education. Offered fall semesters. Same as 7S:255.

7E:256 Science Education: The Nature of Science 3 s.h.
Topics in philosophy, psychology, history, and sociology of science that are related to research, practice, and current issues in science education. Offered spring semesters. Same as 7S:256.

7E:257 Science Education: Teaching, Learning, and Curriculum Models 2-3 s.h.
Teaching strategies, instructional models, and curriculum theory as they relate to science teaching in elementary, secondary, and college settings. Offered fall semesters. Same as 7S:257.

7E:258 Science Education: Research Models and Conceptual Schemes 3 s.h.
Models of research design and major research efforts in science education; emphasis on current reports and yearly reviews of science education research. Offered spring semesters. Same as 7S:258.

7E:260 Supervision of Elementary School Language Arts 3 s.h.
Curricular models, curriculum development, methodology, and materials for elementary language arts; focus on the interactive processes of composition and comprehension through oral, written, and visual modes in personal exploration, skill, and concept development experiences.

7E:261 Supervision of Elementary School Social Studies 3 s.h.
Curriculum content used for consideration of modern classroom procedures; cooperative problem assignment; provision for individual differences and functional development of study skills.

7E:262 Advanced Techniques of Teaching Science in the Elementary School 3 s.h.
Theories of teaching science at the elementary school level; emphasis on procedures that permit implementation of modern philosophies characterizing elementary school science education; primarily for experienced elementary teachers progressing toward graduate degrees.

7E:263 Supervision of Elementary School Mathematics 2-3 s.h.
History of mathematics education in the United States; learning theory applied to teaching and learning mathematics; critical reading of research, selected research results; curriculum design, recent trends.

7E:264 Building Foundations for Reading: Preprimary and Primary 2-3 s.h.
Understanding of early reading experiences; relationship of reading to other communication areas; knowledge of instructional approaches, techniques, materials, and assessment procedures; interrelationship of home and school experiences; identification of current and crucial issues and relevant research.

7E:265 Supervision of Intermediate Grade Reading 3 s.h.
Reading with comprehension, provision for individual differences, research in reading, extension of skills taught in primary grades; for teachers, principals, and supervisors.

7E:267 Curriculum Development in Early Childhood (5-8 Years) 3 s.h.
Crucial and current problems in selection and organization of curriculum and in methods of teaching to promote learning; theory and practice.

7E:268 Curriculum Development in Early Childhood (0-5 Years) 3 s.h.
Current and crucial issues in curriculum development and delivery to children in group settings. Prerequisite: 7E:157 or equivalent.

7E:271 Advanced Reading Clinic Techniques 2-3 s.h.
Special instructional procedures for children with severe learning problems in reading; causes of reading disorders; educational prognosis for severely disabled readers.

7E:272 Advanced Reading Clinic Practicum 2-3 s.h.
Practice in selecting and using special instructional procedures; fitting clinical teaching techniques into a balanced developmental reading framework.

7E:280 Supervision of Student Teachers and Auxiliary Personnel 2-3 s.h.
Analysis of techniques and strategies for supervising student teachers; review of techniques for utilizing volunteer and paid teacher aides; for teachers, supervisors, and principals.

7E:292 Early Childhood Practicum 3 s.h.
Guided participation under a certified early childhood teacher; for persons with limited or no experience in early childhood programs.

7E:293 Individual Instruction in Early Childhood and Elementary Education arr.
Consent of instructor required.

7E:300 Design and Organization of Curriculum 3 s.h.
Major issues, modern selection, sequential arrangement, and organization of content; relationship of time allotments to implementation; utilization of instructional equipment; appraisal procedures; staff participation in curriculum development.

7E:304 Seminar: Current Issues and Research in Elementary Education 4 s.h.
Major problems, research findings, current developments in instructional programs. Consent of instructor required.

7E:306 Introduction to Research in Art Education 3 s.h.
Methods of inquiry used for research in art education and related disciplines; methods of research design.

7E:308 Seminar: Research and Current Issues arr.
For a specific curricular area: review of the literature, critical analysis of reported research, study of current issues and problems (see current *Schedule of Courses* for specific areas offered). May be repeated. Consent of instructor required.

7E:365 Reading Clinic: Supervision arr.
Supervised experience in guiding and improving teacher performance in clinical practicums. Consent of instructor required.

7E:366 Administering and Supervising K-12 Science Programs 1-3 s.h.
Theory and practice in coordinating K-12 science programs; science supervisors at state, regional, and local levels are involved; two practicum projects required. Offered spring semesters and summer sessions. Same as 7S:254.

7E:384 Laboratory Practice in Supervision arr.
Individually planned practicum experiences in a variety of supervisory roles. Consent of instructor required.

7E:385 Practicum in College Teaching arr.
Consent of instructor required.

7E:391 Research Project arr.
Individual research projects in a specific curricular area; for advanced students. May be repeated. Consent of instructor required.

7E:392 Field Service Project arr.
Individual field service project in a specific curricular area; for advanced students. May be repeated. Consent of instructor required.

7E:393 M.A. Thesis in Early Childhood and Elementary Education arr.
Consent of instructor required.

7E:405 Seminar: Child Art and Art Education 2-3 s.h.
Analysis and evaluation of current concepts of child art and development, perception, creativity, and art education; historical development of theories of child art and development, and art education. Same as 7S:405.

7E:406 Research in Art Education arr.
Individual research under supervision; applicable to thesis preparation and to doctoral prospectus development. May be repeated. Same as 1E:406, 7S:406.

7E:493 Ph.D. Thesis in Early Childhood and Elementary Education arr.
Consent of instructor required.

Secondary Education

7S:90 Introduction to Teaching Art 2 s.h.
Students observe and assist art teachers and students in elementary or secondary schools; four to six hours per week in the school plus on-campus class meetings. Admission to TEP required.

7S:91 Introduction to Teaching English and Speech 3 s.h.
Students observe and assist English or speech teachers and students in secondary schools; 12 hours per week in the school plus on-campus class meetings. Admission to TEP required.

7S:92 Introduction to Teaching Foreign Language 2 s.h.
Students observe and assist foreign language teachers and students in secondary schools; four to six hours per week in the school plus on-campus class meetings. Admission to TEP required.

7S:93 Introduction to Teaching Home Economics 2 s.h.
Students observe and assist home economics education teachers and students in secondary schools; four to six hours per week in the school plus on-campus class meetings. Admission to TEP required.

7S:94 Introduction to Teaching Journalism 3 s.h.
Students observe and assist journalism education teachers and students in secondary schools; four to six hours per week in the school plus on-campus class meetings. Admission to TEP required.

7S:95 Introduction to Teaching Mathematics 3 s.h.
Students design and teach problem-solving and concept development lessons using direct instruction strategies, discovery approaches, and laboratory methods; study and practice methods of classroom control; and spend four to six hours per week in a cooperating school. Admission to TEP required.

7S:96 Introduction to Teaching Music 2 s.h.
Students observe and assist music teachers and students in elementary or secondary schools; four to six hours per week in the school plus on-campus class meetings. Admission to TEP required.

7S:97 Instructional Strategies and Design in Physical Education 3 s.h.
Instructional design, teaching strategies, unit/lesson planning, classroom management, and secondary-level practicum of 30-40 contact hours. Admission to TEP required.

7S:99 Introduction to Teaching Social Studies 2 s.h.
Students observe and assist social studies teachers and students in secondary schools; four to six hours per week in the school plus on-campus class meetings. Admission to TEP required.

7S:100 Issues in Education 2 s.h.
Overview of contemporary American secondary education, including aims of education, social context of education, school curriculum and organization, school law, and control of education. Junior standing required. Prerequisites: 7P:75, one course from 7S:90-99, and 7F:180.

7S:101 Introduction to Education 3 s.h.
Basic orientation in the field of education; administrative organization, instructional procedures, and contemporary problems at both elementary and secondary levels. Same as 7E:101.

7S:102 Directing Forensic Activities 3 s.h.
Forensic program planning, organization, and evaluation at the secondary level; establishment of cocurricular forensic programs; prepares students to direct competitive activities. Same as 36:107.

7S:103 Administration of Physical Education and Athletics 2-3 s.h.
Administrative issues in both physical education and athletics; topics include theory, budgeting practices, legal liability, public relations, and evaluation of personnel. Same as 7E:103, 138:103.

7S:105 Advanced Methods: Art 3 s.h.
Art education theory and methods at elementary and secondary levels; art curriculum, unit, and lesson

planning; evaluation, motivation, and instructional materials; observational techniques.

7S:112 Introduction to Museology **2 s.h.**
Introduction to history, philosophy, function, and management of museums and related institutions; emphasis on American museums. Same as 24:112, 113:103, 104:112, 97:115.

7S:113 Methods: Secondary School Journalism **3 s.h.**
Methods and materials for teaching high school journalism; publication policies, staff organization, production schedules, and techniques for advising student publications. Offered fall semesters. Same as 19:101.

7S:115 Methods: English **3 s.h.**
Organizational techniques, methods, and materials for teaching high school English; experience in simulated teaching situations during laboratory sessions, integrated with lectures and discussions. Same as 8P:190.

7S:116 Methods: Foreign Language **3 s.h.**
Theories, methods, procedures, and materials for helping secondary school students develop knowledge of a foreign language and culture and proficiency in foreign language skills. Same as 9:150, 13:120, 20:119, 35:115.

7S:117 Methods: Elementary School Foreign Language **2-3 s.h.**
Methods, materials, procedures, and the theoretical base for ensuring effective foreign language instruction in elementary schools.

7S:124 Language Laboratory Equipment Procedures **2 s.h.**
Use of language laboratory equipment and materials.

7S:125 Methods: Home Economics **3 s.h.**
Philosophy, materials, and methods in home economics. Same as 17:120.

7S:126 Materials and Methods in Family Life Education **3 s.h.**
Philosophy, resources, and methods of presenting family life education materials in elementary, middle, junior high, high school, and adult education. Same as 17:122.

7S:130 Workshops for Secondary School Journalism and Communication Teachers **1-2 s.h.**
Teaching journalistic writing and editing, photography, design, typography, and current technology; developing curriculum and advising student publications; for teachers responsible for journalism publication programs or classes. Same as 19:102.

7S:131 Introduction to Computer Programming for Teachers **2-3 s.h.**
Program design and computer science concepts; structured programming, BASIC control structures, arrays, introduction to files, and programming applications in education.

7S:134 Curriculum and Methods: Middle/Junior High Mathematics **3 s.h.**
Survey of modern subject matter, organization of content, and techniques of teaching in grades 5-8. Prerequisites: 22M:50, 22M:70, and 22S:120.

7S:135 Curriculum and Methods: High School Mathematics **3 s.h.**
Survey of modern subject matter, organization of content, and techniques of teaching in grades 9-12. Consent of instructor required. Prerequisites: 22M:50, 22M:55, 22M:70, and 22S:120.

7S:137 Physical Education Curriculum: Issues and Trends **3 s.h.**
Strategies for the K-12 setting. Same as 7E:137, 27:137.

7S:138 Practicum: Band Instrument Care and Repair **1 s.h.**

7S:139 Child and Adolescent Voice Production **2 s.h.**
Principles and techniques of voice production and pedagogy for developing confident singers at the elementary and secondary school levels; study of specific skills-building program for implementation in vocal music programs. Same as 25:111.

7S:140 Band Methods and Materials **3 s.h.**
High school and elementary school music methods required for teaching certificate; for instrumental music education majors.

7S:141 Measurement and Evaluation in Music Education **3 s.h.**
Measurement and evaluation techniques for music aptitude, achievement, and preference; emphasis on developing teacher-made tests and on available standardized music tests.

7S:142 Methods and Materials: Secondary School General Music **3 s.h.**
Literature, methods, materials, and organizational plans of general music courses in secondary schools; role of music in allied arts and humanities-related arts courses.

7S:143 Instrumental Techniques **1-3 s.h.**
Same as 25:105.

7S:144 Psychology of Music **2 s.h.**
Cognition of music, affective response, aesthetic response, musical ability.

7S:145 Instrumental Conducting **2 s.h.**
Advanced skills for instrumental conducting, score analysis, rehearsal techniques, and literature selection. Prerequisite: 25:107. Same as 25:108.

7S:146 Methods of Secondary Physical Education **3 s.h.**
Use of videotapes of student micro-taught lessons to study the spectrum of methodologies, teaching behaviors, classroom procedures, and contemporary approaches to self-analysis of teaching; usually taken the semester prior to student teaching. Prerequisite: 7S:97.

7S:147 Choral Methods **3 s.h.**
Materials and procedures for teaching in school choral programs, including vocal development for the young singer; students preparing to teach in elementary or secondary schools must register under 7S:147. Same as 25:109.

7S:148 Choral Conducting and Literature **3 s.h.**
Advanced skills appropriate to choral conducting, analysis, and literature selection studied and implemented to develop a secure approach to choral art; students preparing to teach in the elementary or secondary schools must register under 7S:148. Prerequisite: 7S:147. Same as 25:110.

7S:149 Behavioral Research in Music **2-3 s.h.**
Prepares students to conduct research on music behavior.

7S:150 String Methods and Materials **2-4 s.h.**
Same as 25:112.

7S:151 Science Methods I: Elementary School Seminar and Practicum **2 s.h.**
Integration of instructional theory and science curriculum with classroom practice; students participate in a series of clinical experiences in science with emphasis on methods for personalizing the science curriculum.

7S:152 Science Methods II: Resources, Research, Teaching Strategies, and Curriculum Development for K-12 Science **3 s.h.**
Students develop a research-based rationale for teaching science; teaching strategies, self-evaluation, and lesson design; students are videotaped teaching in a ninth-grade class.

7S:153 Science Methods III: Middle/Junior High School **2 s.h.**
Communication skills, self-evaluation, cognitive development, and individualized instruction; generally deals with middle/school/junior high issues.

7S:158 Methods and Administration of School Health Programs **3 s.h.**
Administration of health education programs, teaching methodologies or approaches, materials development, health concepts. Same as 28:146.

7S:159 Practicum in College Tutoring **0-4 s.h.**
Training and experience in college tutoring for qualified students, tutors, and teaching assistants; emphasis on diagnosis of instructional needs, selected tutoring skills, planning and evaluation procedures. Consent of instructor required.

7S:160 Methods: Communication **3 s.h.**
Patterns in teaching, curricular programs, objectives, instructional methods and materials, effects of oral and written criticism and evaluation, testing and grading, textbooks and references, periodicals and sources of publications; contemporary communication education theory and practice. Same as 36:160.

7S:161 New Activities for K-12 Science **arr.**
Integration of new instructional materials in existing course outlines and recent national curricula.

7S:170 Methods: Social Studies **3 s.h.**
Analysis of the teaching-learning process; organization of social studies content for teaching purposes; evaluation of learning procedures and new strategies; practicum work includes microteaching, computer-assisted modules, lesson plan development, and writing test items.

7S:178 Workshop in Teaching Communication and Forensics **arr.**
Methods, materials, progression, and evaluation in teaching; supervision of students in courses and class activities; opportunities for observation, demonstration, and practice in teaching discussion and debate, and in individual speech and forensic events. Same as 36:178.

7S:182 Language and Learning **2-3 s.h.**
How language growth reflects and enables cognitive development; readings in psychology, anthropology, and education; discussion of the relationship of language theory to schools of language instruction. Same as 7E:182, 8P:182.

7S:186 Curriculum Foundations **2-3 s.h.**
Elementary and secondary background developments in curriculum; definitions, historical perspective, philosophies, theories of knowledge, models, learning theories, directions of development and shaping forces; product oriented. Same as 7E:186.

7S:187 Seminar: Curriculum and Student Teaching **1-3 s.h.**
Discussions, role-playing, group and individual reports, analysis of critical incidents, videotapes of student classroom performance pertinent to participants' student-teaching experiences. May be repeated. Corequisite: student teaching.

7S:188 Practicum in Teaching and Curriculum Development in Gifted Education **1-6 s.h.**
Includes experience in developing course materials for classes offered through the Belin Center. Same as 7C:188, 7E:188, 7U:188.

7S:189 Elementary School Special Subject Area Student Teaching **1-4 s.h.**
Supervised teaching experience in a single subject in grades 1-6.

7S:190 Individual Projects in Laboratory Practice **1-3 s.h.**
Projects in curriculum and instruction related to student teaching experience supervised by the University; culminates in written report on projects.

7S:191 Observation and Laboratory Practice in the Secondary School **arr.**
Student teachers acquire experience in performing the duties of regular classroom teachers under supervision of experienced personnel in secondary schools. Consent of instructor required.

7S:192 Observation and Laboratory Practice in the Secondary School **arr.**
Continuation of 7S:191. Consent of instructor required.

7S:193 Literature for Adolescents **3 s.h.**
Reading and evaluation of literature suitable for junior and senior high school students. Same as 8P:198.

7S:194 Methods: High School Reading **2-3 s.h.**
Methods and materials used in teaching developmental reading in all junior and senior high school content areas. Offered fall semesters and summer sessions.

7S:195 Developing Reading Skills in the Secondary School **2-3 s.h.**
Improving junior and senior high school students' reading skills through remedial and developmental instruction; implementing continuous instruction in reading skills through junior and senior high school; fostering an interest in reading. Offered spring semesters and summer sessions.

7S:197 Principles of Course Design for Foreign Language Instruction **3 s.h.**
Introduction to contemporary views of second language curriculum design; guidelines necessary for the creation of prototypical curriculum units to be transposed into classroom-ready forms. For individuals interested in foreign language materials development.

7S:198 Coaching Practicum **1-3 s.h.**
Supervised experience in coaching interscholastic teams under the direction of certified secondary school coaches. Open only to students completing teaching and coaching certification programs. Admission to TEP and consent of instructor required.

7S:199 Special Topics in Secondary Education 1-3 s.h.
Topics of special interest to specific groups of school personnel; topics announced prior to registration. May be repeated.

7S:206 Curriculum Development in Music Education 2 s.h.
Curriculum development, instructional materials, analysis of current teaching methods and techniques in school music programs. Same as 7E:206.

7S:215 Supervision: Language Arts and Reading 3 s.h.
Methods and procedures for observing, instructing, and evaluating potential teachers.

7S:216 Problems in the Teaching of English 2 s.h.
Framework for studying current issues in language arts.

7S:230 Workshop in Secondary School Mathematics 0-3 s.h.
One to three weeks of intensive examination of and experience with recent developments in secondary school mathematics teaching methods and curriculum relevant to a selected issue.

7S:231 Computer-Based Teaching of Secondary School Mathematics 2-3 s.h.
Methods and materials for incorporating computer programming into junior/senior high school mathematics classes; use and evaluation of mathematics software; organization and development of courses; evaluation of computer hardware; emphasis on microcomputers.

7S:235 Current Issues in Mathematics Education 2-3 s.h.
Recent curriculum developments, experimental programs, research relevant to classroom instruction, and trends in education that may have a significant impact on mathematics programs. Same as 22M:195.

7S:236 The Teaching of Geometry 2-3 s.h.
Current developments in teaching middle school/junior high and high school geometry; selection and organization of content.

7S:238 Teaching the Low Achiever in Mathematics 2-3 s.h.
Implementing programs for improving both attitude and mathematical proficiency of low achievers in mathematics; organization for instruction, issues related to mainstreaming low achievers, methods of instruction, curriculum, and research on teaching.

7S:239 Teaching of Algebra 2-3 s.h.
Current developments in curriculum and instructional methods in secondary school algebra; classroom use of the history of algebra, use of computer and electronic calculators, implications of current research for the algebra teacher.

7S:240 Foundations of Music Education 2 s.h.
Historical, philosophical, sociological, and psychological foundations of music education as the bases for developing school music programs.

7S:241 Instrumental Music Workshop 1 s.h.
Materials and innovative instructional procedures for teaching instrumental music in public schools and colleges. May be repeated. Same as 25:220.

7S:242 Supervision of Physical Education 3 s.h.
Program supervision and evaluation, procedures for supervision and evaluation of teachers, and analysis of teaching methodology; primarily for administrators, experienced teachers, and graduate students in the field of administration or supervision. Same as 27:242, 7E:242.

7S:244 Individual Projects in Music Education 1-2 s.h.
Projects of special concern to individual music teachers in the public schools.

7S:246 Music Workshop: Individual Projects 1 s.h.
Specific application of innovative practices to local school settings. May be repeated. Corequisites: 7S:241, 7S:343, 7S:344.

7S:249 Research-Based Instruction in Science 2 s.h.
Same as 7E:249.

7S:250 Program and Research Problems in Science Education 2 s.h.
Identification of program and research problems; group involvement in preparing solutions; potential external funding sources. Same as 7E:250.

7S:251 Preparation of Curriculum Materials for School Science 1-3 s.h.
Preparation of instructional materials for science courses. May be repeated.

7S:252 Designing Strategies for Science Instruction 1-3 s.h.
Strategies and instructional models characterizing science instruction at the elementary, secondary, and college levels. Offered spring semesters and summer sessions.

7S:253 Recent Curriculum Developments in Science 1-3 s.h.
Review of national curriculum efforts for school science, including materials, rationale, teaching strategies. Offered summer sessions.

7S:254 Administering and Supervising K-12 Science Programs 1-3 s.h.
Problems, practices, responsibilities, and techniques characterizing the position of science supervisor; articulation of K-12 programs; primarily for supervisor trainees and advanced students. May be repeated. Offered spring semesters and summer sessions. Same as 7E:366.

7S:255 Science Education: Issues, History, and Rationale 2-3 s.h.
Intermediate topics in philosophy and psychology of science, implications for research and practice in science education. Offered fall semesters. Prerequisite: previous work in philosophy or psychology of science. Same as 7E:255.

7S:256 Science Education and the Nature of Science 3 s.h.
Historical and sociological understanding of the nature of science; applications of that understanding to problems and issues in science education. Offered spring semesters. Prerequisite: previous work in history or sociology of science. Same as 7E:256.

7S:257 Science Education: Teaching, Learning, and Curriculum Models 2-3 s.h.
Theory and techniques for designing printed and laboratory material for science programs. Offered fall semesters. Same as 7E:257.

7S:258 Science Education Research Models and Conceptual Schemes 3 s.h.
Same as 7E:258.

7S:277 Seminar: Social Studies Education arr.
Periodical literature, trends, curricular developments, and research in various aspects of social studies education; for master's and doctoral candidates in social studies education. Offered fall semesters. Same as 98:202.

7S:279 Experimental Research in Music Education 3 s.h.
The design, performance, and reporting of experimental research studies chosen to illustrate methods of experimental control and statistical evaluation in music. Prerequisite: 7S:149.

7S:281 Junior High School and Middle School Curriculum 2-3 s.h.
Comparison of practices in junior high school and middle school; objectives and content in various subject areas; current trends; curriculum planning.

7S:291 Secondary School Curriculum 2-3 s.h.
Theory and development of secondary school curriculum; analysis of components of curriculum; practices and issues in various subject areas.

7S:293 Individual Instruction in Secondary Education arr.
Consent of instructor required.

7S:294 Seminar: Secondary Reading arr.
Analysis and evaluation of pertinent research in secondary reading through historical and comparative procedures. Consent of instructor required. Prerequisite: 7S:194.

7S:315 M.A. Seminar: English Education arr.
Significant developments in English education; primary and collateral readings. Consent of instructor required. Same as 8P:405.

7S:316 Seminar: Recent Developments in Literature for Adolescents arr.
Recent literature for teenagers; research on their choices. Same as 21:216, 8P:316.

7S:335 Seminar: Mathematics Education arr.
Analysis of current research, research methodology, and curriculum developments in mathematics education; topics vary. Primarily for Ph.D. candidates. May be repeated.

7S:342 Supervision and Administration in Music Education 2 s.h.
Problems and responsibilities of music supervisors, including curriculum, facilities, financing, supervision, in-service training and reporting, and study of factors influencing music curriculum decisions.

7S:343 Choral Music Workshop 1 s.h.
Materials and innovative instructional procedures for teaching choral music in public schools and colleges. May be repeated.

7S:344 Special Workshops in Music 1 s.h.
Current topics in learning and teaching music in public schools and colleges. May be repeated.

7S:345 Public School Curriculum in Physical Education 2-3 s.h.
Major social, psychological, and biological factors influencing curriculum approaches in physical education; emphasis on current trends; investigative or creative project required. Same as 27:237, 7E:237.

7S:350 Seminar: Science Education 0-2 s.h.
Discussion of completed faculty and doctoral candidates' research, national issues, program features.

7S:355 Ph.D. Internship 2-3 s.h.

7S:356 Science Education Internship: Teacher Education Supervision and Administration arr.

7S:357 Science Education Internship: Teaching and Learning Strategies arr.

7S:367 Seminar: Current Issues in Art Education 2-3 s.h.
Analysis of literature in art education and related disciplines. May be repeated.

7S:368 Ph.D. Seminar: Current Research in Science Education 1-3 s.h.
Significant ongoing research programs in the field; emphasis on faculty research.

7S:391 Problems of Curriculum Planning 2-3 s.h.
Organizing and conducting programs of curriculum improvement; techniques for developing curriculum materials; includes field experience.

7S:392 Field Service Project in Secondary Education arr.
Consent of instructor required.

7S:393 Master's Degree Thesis arr.
Consent of instructor required.

7S:395 Educational Specialist Research in Secondary Education arr.
Consent of instructor required.

7S:405 Seminar: Child Art and Art Education 2-3 s.h.
Analysis and evaluation of current concepts of child art and child development, perception, creativity, and art education; historical development of theories of child art, child development, and art education. Same as 7E:405.

7S:406 Research in Art Education arr.
Individual research under supervision; applicable to thesis preparation and to doctoral prospectus development. May be repeated. Same as 1E:406, 7E:406.

7S:407 Research: Science Education arr.
Planning of individual research projects by M.S. and Ph.D. candidates.

7S:415 Ph.D. Seminar: English Education arr.
Recent research and theory in education as it affects English in the secondary schools. May be repeated. Consent of instructor required. Same as 8P:425.

7S:445 Social and Psychological Factors in Music Education 3 s.h.
Social and psychological factors that affect curriculum and instructional practices in music. Open to doctoral students in music education, and other graduate students with consent of instructor.

7S:493 Ph.D. Thesis arr.
Consent of instructor required.

Special Education

Courses at the 100 level are open to students in education and related disciplines.

7U:117 Interdisciplinary Programs for Disabled 3 s.h.
Introduction to theory and practice of interdisciplinary programming: roles and responsibilities of different disciplines serving disabled persons, cooperative service strategies, case management, individual program planning; includes case studies, role plays, and simulations. Consent of instructor required. Same as 42:117.

7U:121 Career Education and Transition 3 s.h.
Curriculum, programs, and delivery systems that help handicapped individuals become employable; techniques of job and task analysis; identifies agencies designated to assist the handicapped; field work stations and job training sites are required.

7U:123 Mainstreaming Methods and Materials for the Classroom Teacher 3 s.h.
Methods and materials for working with handicapped students in a general classroom setting.

7U:130 Exceptional Persons 3 s.h.
Survey of children and adolescents who exhibit a variety of exceptional traits; how these traits are addressed in school programs; current issues and trends in special education.

7U:131 Introduction to Learning Disabilities 3 s.h.
The field's status, history, theory, definitions, teaching approaches, programs; unique topics of elementary and secondary school-age students; emphasis on cognitive processes.

7U:132 Introduction to Behavioral Disorders 3 s.h.
Emotional and behavioral issues, definitions, history, and problems of classification, origins of disorders, basic program approaches, school placement, and programming for elementary and secondary students.

7U:133 The Culturally Different in Diverse Settings 3 s.h.
Problems in teaching culturally different children of school age; relevant research on the influence of a disadvantaged background on students' learning potentials. Same as 7C:133.

7U:134 Parent-Teacher Communication 1-3 s.h.
Realities of working with parents; interpersonal skills; options for parent support services. Same as 7E:134, 7P:134.

7U:135 Mental Retardation 3 s.h.
Introduction to the causes and treatment of mental retardation; current issues in mental retardation; educational programming and the role of schools in teaching children with mental retardation.

7U:137 Education of the Gifted 2-3 s.h.
History, identification, characteristics, programming, and educational methods and materials for the gifted; discussion on readings, films, and guest speakers; practical project required. Same as 7C:137.

7U:138 Methods: Children with Physical Disabilities 3 s.h.
Special techniques and adaptations for working with physical disabilities; skill development in classroom management, communicating with parents, counseling the physically disabled. Consent of instructor required.

7U:139 Orientation to Rehabilitation of the Physically Handicapped Child 3 s.h.
Medical, therapeutic, and educational aspects; several professions involved in evaluation, treatment, and general management of handicapped children; nature of various handicapping conditions and causes, and special considerations of each.

7U:140 Topical Workshop in Special Education arr.
Brief treatment of single issues on a series of current problems.

7U:141 Programming for the Gifted 3 s.h.
Fundamental issues; focus on curriculum approaches to working with the gifted. Same as 7C:136.

7U:188 Practicum in Teaching and Curriculum Development in Gifted Education 1-6 s.h.
Includes experience in developing course materials for classes offered through the Belin Center. Same as 7C:188, 7E:188, 7S:188.

7U:190 Interdisciplinary Core Curriculum 2 s.h.
Critical issues related to interdisciplinary delivery of services to persons with developmental disabilities; observation and participation in staffing and consultation; opportunity for related community experiences.

7U:191 Supervised Teaching with Physically Handicapped arr.
Consent of instructor required.

7U:192 Supervised Teaching with Mild MR arr.
Consent of instructor required.

7U:193 Supervised Teaching with Preschool Handicapped arr.
Consent of instructor required.

7U:194 Supervised Teaching with Moderate MR arr.
Consent of instructor required.

7U:199 Individual Instruction in Special Education: Undergraduate arr.
Specialized study of topics not included in other courses. Consent of instructor required.

7U:201 Methods: Children with Learning Disabilities 3 s.h.
Methods and materials appropriate for working with children who have various process and academic types and degrees of learning disabilities. Prerequisites: 7U:131 and 7U:238.

7U:202 Methods: Children with Behavioral Disorders 3 s.h.
Managing behavior for academic and affective learning; instructional resources; consultation with parents and peers. Prerequisites: 7U:132 and 7U:238.

7U:203 Methods: Adolescents with Learning Disabilities 3 s.h.
Educational strategies and methods for teaching the learning disabled adolescent; materials used; intervention approaches for different secondary settings. Prerequisites: 7U:131 and 7U:238.

7U:204 Methods: Adolescents with Behavioral Disorders 3 s.h.
Practical skills for working with behavioral disordered youth in school and community settings; affective and behavioral assessment, effective communication skills, structure and management strategies, adaptation of instructional content, design of innovative program models. Prerequisites: 7U:132 and 7U:238.

7U:206 Practicum with Exceptional Persons arr.
Practicum experience with students with disabilities; experiences differ depending upon student's program of study. Consent of instructor required.

7U:207 Supervised Teaching with Learning Disabled arr.
Student teaching with learning disabled at elementary or secondary level. Special education major and consent of instructor required.

7U:208 Supervised Teaching with Behavior Disordered arr.
Student teaching with behavioral disordered at elementary or secondary level. Special education major and consent of instructor required.

7U:209 Seminar: Graduate Supervised Teaching 1 s.h.
For students enrolled in graduate student teaching practicum. Special education major and consent of instructor required. Corequisite: 7U:207 or 7U:208 or 7U:220 or 7U:222.

7U:210 Characteristics and Programs: Persons with Severe Behavioral Disorders 2 s.h.
Characteristics of the most severe behavioral disordered children and youth; emotional implications of these characteristics and the functional life needs; demonstration of programs for this severely disabled population. Prerequisite: 7U:132 or consent of instructor.

7U:211 Interventions: Persons with Severe Behavioral Disorders 2 s.h.
Intervention methods for severe behavioral disordered children and youth; skills in communication, management, curriculum, program supports, and assessment. Prerequisites: 7U:132, and 7U:238 or 7U:240 or consent of instructor.

7U:212 Characteristics and Programs: Persons with Autism 1-3 s.h.
Introduction to autism; definition, assessment, research information, communication skills, speech, and language development of autistic persons. Consent of instructor required.

7U:213 Interventions: Persons with Autism 1-2 s.h.
Methods and materials for teaching autistic persons; information for working with parents of autistic persons; persistent problems and adult care. Prerequisite: 7U:212 or consent of instructor.

7U:214 Methods: Children with Mild Mental Retardation 3 s.h.
Methods of developing programs; teaching and assessing progress in math, language arts, reading, social learning; behavior and classroom management; home-school relationships. Prerequisites: 7U:135 and 7U:238.

7U:215 Methods: Adolescents with Mild Mental Retardation 3 s.h.
Methods of assessing and teaching skills in academic and vocational areas; classroom management; transition from secondary school to work. Prerequisites: 7U:130, 7U:135, and 7U:238.

7U:216 Methods: Elementary Resource Teaching 3 s.h.
Methods and materials for working with mildly handicapped students in elementary resource programs. Prerequisites: 7U:130, 7U:238, and two of the following: 7U:131, 7U:132, 7U:135.

7U:217 Methods: Secondary Resource Teaching 3 s.h.
Methods and materials for working with mildly handicapped students in secondary resource programs. Prerequisites: 7U:130, 7U:238, and two of the following: 7U:131, 7U:132, 7U:135.

7U:220 Supervised Teaching with Mild Mentally Retarded 3 s.h.
Student teaching with mild mentally retarded at the elementary or secondary level. Special education major and consent of instructor required.

7U:222 Supervised Teaching in Resource Programs 5 s.h.
Student teaching with children in a resource program setting. Consent of instructor required. Open only to special education majors.

7U:225 Supervised Teaching in Multicategorical Special Class 5 s.h.
Student teaching experience with handicapped students in multicategorical special classes at the elementary or secondary level. Open only to special education majors. Consent of instructor required.

7U:236 Administration of Students with Special Needs 3 s.h.
Provides a foundation for and skill practice in tasks performed by directors of special education; for prospective directors of special education and school administrative personnel. Same as 7D:236.

7U:238 Assessment of Learning Difficulties 1-3 s.h.
Administration of individual educational assessment instruments and interpretation of test results; supervised practice in assessment and planning. Consent of instructor required. Same as 7P:238.

7U:240 Behavioral Principles 1-3 s.h.
Principles of behavior modification; defining/measuring behaviors; functional behavior analysis; proactive treatment strategies; reactive treatment strategies; behavioral assessment/treatment of stereotypic/self-injurious behavior; behavioral assessment/treatment of aggressive/disruptive behaviors; use of single-case experimental designs.

7U:241 Methods: Persons with Moderate/Severe/Profound Mental Disabilities I 3 s.h.
Instructional domains; functional, age-appropriate, community-based curriculum development; meaningful assessment; integration in regular schools and communities; domestic and community functioning, leisure/recreation, and vocational skills; functional academics. Prerequisites: 7U:130, 7U:135, 7U:238, and 7U:240; or consent of instructor.

7U:242 Methods: Persons with Moderate/Severe/Profound Mental Disabilities II 3 s.h.
Systematic instruction and application to functional skills training; design of appropriate instructional programs; data collection systems. Prerequisite: 7U:241 or consent of instructor.

7U:243 Issues: Persons with Moderate/Severe/Profound Disabilities 3 s.h.
Enhancing participation of persons with multiple disabilities through partial participation and individualized adaptations; positioning and handling techniques; integrating therapy into educational programs.

Prerequisites: 7U:130, 7U:135, and 7U:238; or consent of instructor.

7U:244 Supervised Teaching: Moderate Mentally Retarded **3 s.h.**
Student teaching in special education classroom serving students with moderate mental retardation. Corequisite: 7U:246.

7U:245 Supervised Teaching: Severe/ Profound **3 s.h.**
Student teaching in special education classroom serving students who are severely/profoundly handicapped. Corequisite: 7U:246.

7U:246 Seminar: Teaching Moderate/Severe/ Profound **1 s.h.**
Corequisite: 7U:244 or 7U:245.

7U:252 Seminar: Behavioral Assessment and Evaluation **3 s.h.**
Broadens skills of graduate students who engage in research with exceptional persons; research designs are usually taught in the Division of Psychological and Quantitative Foundations, but because of the nature of handicapping conditions and the low incidence of some handicaps, the single-subject design yields better research information. Prerequisite: 7U:240. Same as 7P:352.

7U:260 Special Education Consultation **2 s.h.**
Skills for conducting in-service needs of special education teachers, delivering staff in-service programs, and evaluating effectiveness of in-service programs.

7U:271 Assessment of Young Children with Disabilities **2 s.h.**
Theory and practice for inter/transdisciplinary assessment of young children and family needs. Prerequisite: 7U:130 or consent of instructor.

7U:272 Development of Young Children with Disabilities **2 s.h.**
Normal and atypical development of young children; emphasis on implications of specific disabilities. Prerequisite: 7U:130 or consent of instructor.

7U:273 Methods: Early Childhood Special Education Ages 0-3 **3 s.h.**
Methods and materials for working with special needs infants and young children up to age 3, including medically fragile children. Pre- or corequisite: 7U:271.

7U:274 Methods: Early Childhood Special Education Ages 3-6 **3 s.h.**
Methods and materials for working with children ages 3-6, including alternative modes of communication. Pre- or corequisite: 7U:271.

7U:275 Families of Young Children with Disabilities **3 s.h.**
Research and practice in early intervention; emphasis on impact of the special needs child on family life, parent-child interaction patterns, facilitating psychosocial support, developing cooperative relationships with parents, family involvement in planning and implementation.

7U:276 Supervised Teaching: Early Childhood Special Education I **3 s.h.**
Student teaching in a home-based early intervention program. Prerequisite: 7U:273.

7U:277 Supervised Teaching: Early Childhood Special Education II **3 s.h.**
Student teaching in a center-based early intervention program. Prerequisite: 7U:274.

7U:278 Seminar: Teaching Early Childhood Special Education **1 s.h.**
Research and practices related to early intervention services for young children and their families. Corequisite: 7U:276 or 7U:277.

7U:293 Individual Instruction in Special Education **arr.**
Permits specialized study of topics not included in other courses. Consent of instructor required.

7U:330 Impact of Law on Education: Seminar **3 s.h.**
Same as 7D:330.

7U:342 Research Projects in Special Education **1-2 s.h.**
Identifies and provides experience in research facilities on campus; assists students in writing research questions, writing a dissertation proposal, and/or developing a research article. Consent of instructor required.

7U:343 Current Readings in Special Education Research **2 s.h.**
Recent research from a variety of areas of special education reviewed by students; simulated comprehensive examinations. Consent of instructor required.

7U:345 Current Issues and Trends in Learning Disabilities **3 s.h.**
Readings and discussions of current issues and trends in learning disabilities (e.g., definition, prevalence, interventions, subtyping, assessment).

7U:347 Current Issues and Trends in Behavioral Disorders **3 s.h.**
Readings and discussions of current issues and trends in behavioral disorders (e.g., definition, prevalence, interventions, assessment).

7U:348 Contemporary Research in Behavioral Disorders **3 s.h.**
In-depth analysis of current research in behavioral disorders; emphasis on evaluating its methodology and contribution to the field.

7U:349 Current Issues and Trends in Mental Retardation **3 s.h.**
Readings and discussions of current issues and trends in mental retardation (e.g., definition, prevalence, cognitive and social characteristics, assessment, and curriculum).

7U:352 Methods for Quantitative Research Synthesis **3 s.h.**
Conceptual and empirical review of methods of research integration; emphasis on quantitative procedures (e.g., meta-analysis) with regard to their theoretical and technical foundations.

7U:353 Seminar: Single Subject Design Research **3 s.h.**
Students design and implement a single subject research project; education, psychology, speech/language, health-related fields; final article required. Consent of instructor required.

7U:367 Seminar: Current Issues in Special Education Administration **arr.**
New developments in administration; major content changes each year. May be repeated. Consent of instructor required. Prerequisite: 7U:236. Same as 7D:367.

7U:380 Practicum in College Teaching **arr.**
Supervised experience in teaching basic special education courses; for doctoral students majoring in teacher training. Consent of instructor required.

7U:392 Field Service Project in Special Education Internship **arr.**
Part-time or full-time experience as an intern in school districts or area education agencies; develops skills in supervision and administration of special education. Consent of instructor required.

7U:395 Educational Specialist Research **arr.**
Research involving design, data analysis, and writing of results as culmination of requirements for the Ed.S. degree. Consent of instructor required.

7U:493 Ph.D. Thesis in Special Education **arr.**
Consent of instructor required.

PLANNING, POLICY, AND LEADERSHIP STUDIES

Chair: Chester S. Rzonca
Program coordinator, educational administration: George A. Chambers
Program coordinator, higher education: Chester S. Rzonca
Program coordinator, social foundations of education: William E. Duffy
Professors: Arthur C. Burman, George A. Chambers, Walter J. Foley, Alan B. Henkin, Bradley M. Loomer, H. Bradley Sagen
Professors emeriti: Jerry N. Kuhn, John E. McAdam
Associate professors: Duane D. Anderson, Larry D. Bartlett, David B. Bills, William E. Duffy, Robert E. Engel, Scott F. McNabb, Ray A. Muston, Chester S. Rzonca
Associate professor emeritus: Owen L. Springer
Assistant professors: Lelia B. Helms, Charles M. Mason
Assistant professor emeritus: John B. Cox
Adjunct assistant professors: Stephen Arum, Jerald W. Dallam, Lyle Hellyer, Martha Milani, Von V. Pittman, Jr.
Adjunct assistant professor emeritus: Wendell C. Boersma
Assistant lecturers: Joyce A. Brandt, V. Jane Muhl
Degrees offered: M.A., Ed.S., Ph.D.

The Division of Planning, Policy, and Leadership Studies offers programs that prepare administrators, professional personnel, teachers, and researchers in the fields of educational administration, higher education, and social foundations. The academic programs in the division reflect the diversity of purpose.

Iowa Community College Licensure

Instructor

To qualify for a professional license with authorization to teach in an arts and sciences field of an area community college in Iowa, students must hold a master's degree granted by an approved institution, with specialization in a field of instruction offered in the arts and sciences division of an area college.

All licenses require 3 semester hours of 7F:180 Human Relations for the Classroom Teacher. Also required is course work in areas of professional preparation appropriate to teaching in a community college, which may be satisfied in several ways. Students should consult with their adviser or the program chair.

Administrator

Administrators of units or departments are required to hold or complete a bachelor's degree during the term for which the license is granted. Instructional administrators are required to hold a master's degree with a specialization in administration, a subject field taught in the institution, vocational/technical education, adult education, or student services. Both types of administrators must have four years of successful educational work experience, of which a minimum of two have been at the postsecondary level. Experience must include a minimum of two years of teaching or experience appropriate to the area of administration.

The program in higher education offers approved course work leading to administrator endorsements as well as a course in supervision and evaluation (7H:172), which fulfills state evaluator training requirements. Applicants should consult an adviser to select course work that is appropriate to their area of administration and that meets the college's approved program requirements.

Undergraduate Program

Higher Education—Major in Health Occupations Education

The health occupations education major prepares teachers for employment at the community college level in preparatory health occupations education programs. In addition to basic skill and General Education Requirements of the College of Liberal Arts, students complete courses in professional education and in the health occupations education specialty field and/or supporting areas.

Students who apply to this program must hold current appropriate certification, licensure, or registry appropriate to the area of health occupations education in which they wish to teach (e.g., dental assisting, medical office assisting, or respiratory therapy). The health occupations education major is planned on this base and includes work in professional education and liberal studies appropriate to teachers who want to earn a baccalaureate degree.

Applicants to this program must satisfy criteria for admission to the teacher education program (TEP) of the College of Education.

Program requirements are as follows.

Professional Education Component

7P:75 Educational Psychology and Measurement	3 s.h.
7W:91 Audiovisual Equipment for Instruction	1 s.h.
7W:92 Introduction to Microcomputing for Teachers	1 s.h.
7H:112 Teaching of Adults	3 s.h.
7H:117 Foundations of Vocational Education	2 s.h.
7H:190 Seminar: Health Occupations Education	1-3 s.h.
7H:191 Community College Teaching Internship	6-12 s.h.
7H:192 Curriculum Development: Application to Community College and Health Careers	3 s.h.
7H:193 Evaluation: Application to Community College and Health Careers	2-3 s.h.
Appropriate course in social foundations	2-3 s.h.
Additional specialty course work in health occupations education	10 s.h.

Course work in health occupations education specialty and supporting field should be planned carefully in consultation with the adviser.

Students may take workshops or courses offered by specific health colleges or choose electives such as development of audiovisual aids or computers in education, in keeping with their educational goals.

Graduate Programs

Educational Administration

The program in educational administration prepares individuals for leadership positions. Its programs lead to the M.A., Ed.S., Ph.D. degrees and to administrative certification. Educational administration offers programs jointly with other divisions in the College of Education and with other colleges in the University.

Certification

To be eligible for recommendation by The University of Iowa for certification in Iowa as an elementary principal, secondary principal, or superintendent, students must complete the appropriate program. The specific requirements for each program are available through the division office and the College of Education Office of Student Services.

Students who hold an M.A. degree must satisfy all core requirements and must complete at The University of Iowa the minimum semester-hour program for the certification level they seek. An administrative certification program at a level different from that characterizing the student's prior preparation and experience must be planned with an adviser. Because of the specific requirements for each administrative certification, candidates are required to plan their program with their adviser's approval.

Master of Arts

The primary purpose of the M.A. program is to prepare individuals for appointments as elementary or secondary school principals, central staff, and for certain positions within area education agencies and state departments of education.

The student may take the program with or without thesis (32-semester-hour minimum).

Admission

Applicants must satisfy Graduate College requirements and are selected through a faculty review process. Factors considered include recommendations, grade-point average, Graduate Record Examination (GRE) General Test scores, and other evidence of academic ability and professional promise.

Course Requirements

With the aid of an adviser, the student prepares a plan of study including the following core requirements.

7D:201 Foundations of School Administration	3 s.h.
7D:236 Administration of Students with Special Needs	3 s.h.
7D:261 The Principalship	3 s.h.
7D:298 Legal Aspects of School Personnel	3 s.h.
7D:383 Supervision and Evaluation	3 s.h.
7E:300 Design and Organization of Curriculum	3 s.h.

Students must meet the human relations requirement of the state of Iowa and specialize in elementary, secondary, or central staff administration by completing one of the programs outlined below. Candidates may choose electives approved by the adviser to satisfy the following degree requirements.

Elementary Level

7D:258 Contemporary Management Strategies for the Elementary Principal	3 s.h.
7D:401 Field Service Project in Elementary Administration	arr.

Electives selected with approval of adviser

Secondary Level

7D:260 Contemporary Management Strategies for the Secondary Principal	3 s.h.
7D:402 Field Service Project in Secondary Administration	arr.

Electives selected with approval of adviser

Central Staff Administration

7P:143 Introduction to Statistical Methods	3 s.h.
7D:295 Financial Management of Local School Systems	3 s.h.
7D:404 Field Service Project in Central Administration	arr.

Electives selected with approval of adviser

Thesis

Students electing the M.A. program with thesis must take 7D:393 M.A. Thesis in Educational Administration and a final oral examination on the thesis.

Comprehensive Examinations

Students take two three-hour examinations in areas of emphasis selected with their adviser's approval. Students must be registered in the Graduate College during the semester in which they take the comprehensive examination if they plan on graduating that semester.

Specialist in Education

The Ed.S. program prepares candidates for administrative appointments in area education agencies, state departments of education, and the U.S. Office of Education. It also assists school administrators in upgrading their administrative skills to the level of superintendent of schools. Students seeking certification plan a program approved by an adviser to meet State of Iowa certification requirements.

Admission

Applicants must satisfy Graduate College requirements, and are selected through a faculty review process. Factors considered include recommendations, grade-point average, Graduate Record Examination (GRE) General Test scores, and other evidence of academic ability and professional promise.

Core Requirements

7D:291 Administration of Educational Programs and Personnel	4 s.h.

7D:294 Politics and Economics of the Governance and Financing of Public Education	4 s.h.
7D:297 Administrative Leadership Theory	4 s.h.
7D:299 Legal Aspects of School Administration	2-3 s.h.
7D:395 Educational Specialist Research in Educational Administration	arr.

Program Emphasis

Students must complete the balance of their minimum required semester hours (minus electives) in one of the following areas of emphasis. Courses specifically listed in each area of specialization are the required courses.

Elementary School Administration

7P:150 Introduction to Educational Measurement	3 s.h.
7D:262 School Organization Patterns	3 s.h.
7D:304 Seminar: Supervision and Administration	2-3 s.h.
7C:222 Interventions for Primary Prevention in Schools	3 s.h.

Secondary School Administration

7P:150 Introduction to Educational Measurement	3 s.h.
7D:290 Improving Instruction in the Secondary School	3 s.h.
7C:222 Interventions for Primary Prevention in Schools	3 s.h.

General School Administration

7D:205 Collective Bargaining in Education	3 s.h.
7D:295 Financial Management of Local School Systems	3 s.h.
7D:375 Educational Administration Practicum	arr.
7P:143 Introduction to Statistical Methods	3 s.h.

Electives

Students choose electives completing the 62-semester-hour requirement for the Ed.S. degree. They may choose electives for specialization in fields such as staff personnel, business affairs, instruction, theory, legal aspects, curriculum, and information systems.

Research

All candidates for the Ed.S. degree must complete a formal research paper (4-semester-hours credit) that deals with a specific problem in school administration or instruction.

Comprehensive Examination

The comprehensive examination for the Ed.S. degree comprises one three-hour examination in educational administration and one three-hour examination in a specialized area in either educational administration or a related field. Students must be registered in the Graduate College during the semester in which they take the comprehensive examination if they plan on graduating that semester.

Ed.S. in Special Education Administration

The Education Specialist in Special Education Administration program is offered jointly with the Division of Special Education.

The primary objective of the program is to provide sufficient training and experience to enable graduates to obtain entry-level positions in administration. The career focus of the program is on middle management positions such as supervisor and assistant director. Successful completion of the program qualifies the student for certification in Iowa to serve as a supervisor of special education (State of Iowa Endorsement 233, 238) or director of special education (State of Iowa Endorsement 239). It also qualifies the students for certification in general administration (State of Iowa Endorsement 171). The program requires a minimum of 62 semester hours of credit.

Admission to the program is limited by available resources. Five to eight new students are admitted each year. In addition to the general requirements, admission requirements include a master's degree, certification in some area of teaching exceptional children, qualification for a consultant's endorsement, and classroom experience as a teacher or equivalent experience.

Doctor of Philosophy

The primary purpose of the Ph.D. program is to prepare students for leadership positions at all levels of education (school administration, research, teaching at the college or university level) through individually designed programs that include course work in related disciplines and research pursuits. Emphasis is placed on the integration of theory and practice in the program.

The Ph.D. in educational administration is a flexible program that prepares professionals for leadership positions at all levels of administrative practice and for academic teaching and research positions. Sufficient course work and related experiences are planned individually. Students are expected to achieve competence in the areas of educational program planning, finance and governance, leadership theory, evaluation, and research methodologies that include statistical methods. They also must gain expertise in areas of specialized program and personnel policy analysis.

Course content in the Ph.D. program is divided into prerequisites, a core of common competencies, at least one specialization in the administrative field, cognate study outside the college, research skill development, and a research dissertation.

Commonly selected specialization areas are general administration, elementary school administration, secondary school administration, systems analysis and research, school finance, curriculum, legal aspects, theory, and school personnel. Students must demonstrate proficiency in two research tool areas.

Admission

Applicants must satisfy Graduate College requirements and are selected through a faculty review process. The division admits a maximum of ten students in the fall semester or the preceding summer session. Factors considered include recommendations from college or university faculty that speak to the candidate's scholarship and potential for academic success, grade-point average, and Graduate Record Examination (GRE) General Test scores. Also considered is a written statement addressing one of the following topics: personal philosophy of education, steps in the professionalization of teaching, current educational issues and their administrative impact, or the role of administration in educational organizations.

Complete application materials must be submitted by January 1 for fall semester admission. Admission decisions are made by the division faculty; applicants are notified by February 15.

Core Courses

Core courses are designed to provide the necessary background for further study, including research in specialized areas, and to develop competencies common to the functional areas of school administration. The four core courses integrate planning of educational personnel programs, analysis of the politics and economics of governance and the financing of public education, evaluation of administrative leadership theories, and options in research methodology and quantitative analysis.

Each core course carries four semester hours of credit, is open only to Ed.S. and Ph.D. students, and requires the development and practice of interaction, reading, and writing skills.

Seminars designed primarily for doctoral candidates are offered to supplement each functional core area. Scholarship is reflected in writing, reading, and research in all doctoral seminars.

Cognates

Students specializing in administration must complete a 9-semester-hour cognate outside the College of Education with the adviser's approval.

Comprehensive Examinations

Doctoral students must satisfactorily complete an extensive six-hour comprehensive examination in the six common areas of educational administration, and a three-hour examination based on the student's areas of specialization and approved by the student's adviser and the division chair. Students must have completed the doctoral core courses and/or must be registered for the research requirement to take the comprehensive examination. Students must be registered in the Graduate College at the

time of the exam. No Ph.D. comprehensive examinations are held during summer session.

Students pursuing doctoral programs in areas other than educational administration who want to use some aspect of the educational administration program as an area of concentration for which they would request a comprehensive examination should consult with an adviser in the Division of Educational Administration early in their sequence of study.

Any of the areas of specialization open to doctoral students in educational administration are open to other doctoral students who meet the necessary registration prerequisites for specific courses. Students should complete approximately 12 semester hours in one area of specialization before requesting a comprehensive examination. If the student decides to use a field within educational administration as a related comprehensive area, he or she should plan to complete approximately 18 semester hours of diversified course work in educational administration.

Research Dissertation

Prospectus

All students must write a formal dissertation prospectus and submit it for approval first by their adviser and then by the members of their doctoral committee. Student and adviser determine when the prospectus is complete. A final evaluation of the prospectus and approval to proceed may or may not be granted at the end of the prospectus committee meeting. Dissertation prospectus meetings are not held during summer session.

Completion and Final Examination

Students must accumulate 10 semester hours of dissertation research credit. The doctoral program culminates with final oral defense of the dissertation. Students usually take the examination within a month of their anticipated time of graduation. They must be registered at The University of Iowa during the session in which they graduate.

Residency

Each doctoral candidate must successfully complete two consecutive semesters (a minimum of 9 semester hours excluding thesis credit on campus) to fulfill the residency requirement. The following sample Ph.D. program requires a minimum of 90 semester hours and assumes that students enter with an M.A. and 32 semester hours of graduate credit.

Core Requirements

7D:291 Administration of Educational Programs and Personnel	4 s.h.
7D:294 Politics and Economics of the Governance and Financing of Public Education	4 s.h.
7D:297 Administrative Leadership Theory	4 s.h.
7D:370 Research Methodology and Quantitative Analysis	4 s.h.

Other Required Courses

Cognate courses selected with approval of adviser	9 s.h.
Research design and/or statistics	6 s.h.
Thesis	10 s.h.
Electives selected to permit specialization; students typically include two or more doctoral seminars and accumulate 12 or more semester hours in a special area	
Total	90 s.h.

Social Foundations of Education

Social foundations of education is an interdisciplinary program designed to enable students to better understand the influence of social, historical, and philosophical forces on the formal educational enterprise. Major areas of specialization are comparative/international education, history of education, philosophy of education, policy studies, and sociology of education.

General requirements for admission are as stated by the Graduate College. A personal interview with one or more members of the social foundations faculty is desirable and may be required. An undergraduate and/or graduate emphasis in philosophy, the humanities, or the social sciences and two years of teaching experience are strongly recommended. Students must maintain a 3.00 overall grade-point average to remain in the program.

Master of Arts

Students in the M.A. program must take a minimum of 18 semester hours of work in social foundations, which should include at least two courses in each of three of the five areas of specialization. The remainder of the required 32 semester hours of course work must be in an area of concentration appropriate to students' career and academic goals. For example, students interested in philosophy of education usually take these courses in the Department of Philosophy.

Doctor of Philosophy

The Ph.D. program requires a minimum of 90 semester hours. Students are required to take a minimum of 24 semester hours in social foundations, which must include at least 12 semester hours in the major area of specialization and a minimum of 6 semester hours from each of two additional areas. In addition, students must take at least 12 semester hours in related courses in the College of Education, 9 of which must be in one area of concentration, such as educational administration, educational psychology, measurement and evaluation, and higher education.

Approximately one-third to one-half (30 to 45 semester hours) of each student's program is devoted to course work in depth from at least one other program at the University, such as history, philosophy, political science, or sociology. These sequences are individually planned by the student with the aid of his or her adviser and suggestions from the appropriate department or departments.

Two research tools are required. They may be selected from the following alternatives in accordance with the individual candidate's research interests and program: two courses in a graduate-level statistics sequence; philosophy of science and philosophy of social science; historiography; foreign language(s) proficiency exams.

In addition, all students are required to successfully complete 7H:205 Research Process and Design. Dissertation research is usually taken for 12-15 semester hours of credit.

Higher Education

Postsecondary and continuing education in the United States represents an extensive and complex set of phenomena. The academic programs in higher education encompass that complexity. Degrees are offered at all levels, with emphasis on both research and practice. Preparation for either teaching or administration is available. The teaching, research, and service activities of the faculty and the work of the graduates of the several degree programs illustrate that education beyond the high school level continues in a variety of ways for all ages and in many different settings.

Master of Arts without Thesis

The purpose of the M.A. program in higher education is to prepare individuals for entry- and middle-level administrative, instructional management, continuing education, and policy positions in two- and four-year institutions. It is appropriate preparation for positions such as assistant dean, assistant to the president, director, in-service director, and division or program chair in selected areas.

Admission

Applicants for admission must satisfy the requirements of the Graduate College. Candidates are selected on the basis of grade-point average, Graduate Record Examination (GRE) General Test scores, and promise for professional growth. Transcripts, the GRE scores, three letters of recommendation, and a statement of educational goals are required for consideration for regular admission.

Deadlines for receipt of the application for admission, transcripts, GRE General Test scores, three letters of recommendation, and a statement of educational goals are November 1 for spring semester admission and April 1 for summer session and fall semester admission.

Requirements

The M.A. program requires a minimum of 32 semester hours. Students take six hours

of written examinations based on the core, concentration, and specialization, according to the plan of study developed individually for each student.

Areas of concentration in which examinations may be written are administrative practices, academic practices, continuing education practices, and policy studies. Students majoring in another field who want to complete a related field in higher education and to be eligible to write a related-field examination should consult with a higher education adviser early in their studies. Plans of study will be developed individually.

Specialist in Education

The Ed.S. program provides advanced graduate education in higher education in the areas of administration, academic planning and program development—including an emphasis on academic administration, community college administration, and continuing education for students usually not planning to continue for the doctorate. The specialist degree also may be awarded upon completion of a joint program that consists of a minimum of 60 semester hours of graduate work in higher education and an academic field, or upon completion of a higher education sequence following a master's degree program.

Admission

Applicants for admission must satisfy the general requirements for admission to the Graduate College. Candidates are selected on the basis of grade-point average, GRE General Test scores, and promise for professional growth. Transcripts, GRE scores, three letters of recommendation, and a statement of educational goals are required for regular admission.

Deadlines for receipt of the application for admission, transcripts, GRE General Test scores, three letters of recommendation, and a statement of educational goals are November 1 for spring semester admission and April 1 for summer session and fall semester admission.

Requirements

Requirements for the Ed.S. major in higher education are:

At least 18 semester hours in professional education and related fields, including a structured internship determined in consultation with the adviser to be appropriate for one of the following four areas: administration, academic planning and program development—including an emphasis on academic administration, community college administration, continuing education, and community college teaching;

At least 28 semester hours in the area of specialization, to be determined in consultation with the adviser;

Ten semester hours of electives, to be approved by the adviser;

Research conducted under registration in 7H:395 Educational Specialist Research in Higher Education for 4 semester hours; and

Two three-hour comprehensive examinations: one that covers the field of higher education in general; and one in one of the four concentrations in higher education, perhaps reflecting an area of specialization within the concentration, followed by an oral examination.

Related Field

Students majoring in another field who want to complete a related field in higher education should consult with the higher education adviser early in their studies. Plans of study are developed individually.

Teaching Internship

Program participants teach half-time for a full semester at cooperating community colleges under the supervision of an experienced faculty member in that college and with field supervision from The University of Iowa. Interns participate as fully as possible in the academic life of the host community college, and usually gather data for their Ed.S. research project during the internship.

Participants must be willing to travel to a community college and reside there for the one-semester program. Some interns are accommodated at nearby community colleges, but preference is given to those willing to travel for that experience.

Doctor of Philosophy

The Ph.D. program is designed for persons who are likely to serve as administrators, specialists, researchers, and teachers in postsecondary institutions or related public or private agencies.

The program in higher education offers five areas of concentration: general administration, academic planning and program development—including an emphasis on academic administration, community college administration, continuing education, and policy studies.

It requires a minimum of 90 semester hours beyond the baccalaureate degree.

All higher education students are required to participate in the core experiences (16-19 semester hours). In addition, candidates choose one area of concentration and must earn 16-24 semester hours of credit in that area. Ordinarily, candidates choose a related field of 9-12 semester hours or a minor (approximately 30 semester hours), which may be met by appropriate previous course work at the M.A. level that complements the area of concentration. The dissertation research (12-15 semester hours) must deal with a specific problem in the area of concentration.

These three components—concentration, minor and/or related fields, and dissertation research—constitute a major part of the typical doctoral program and give students the opportunity to specialize in one or more areas of interest.

While the doctoral program places heavy emphasis on administration at both the theoretical and applied levels, students are expected to take course work outside the division, using the flexibility of the program to develop expertise in areas such as organizational analysis and the design and evaluation of instruction.

Comprehensive examinations for the doctorate cover the general area of higher education and the candidate's area of concentration, minor and/or related field, and dissertation.

Admission

Applicants for admission to the doctoral program must satisfy the requirements of the Graduate College. Candidates will be selected on the basis of grade-point average, GRE General Test scores, and promise for professional growth. Transcripts, the GRE General Test scores, three letters of recommendation, and a statement of educational goals are required for regular admission.

Deadlines for receipt of the application for admission, transcripts, GRE General Test scores, three letters of recommendation, and a statement of educational goals are November 1 for spring semester admission and April 1 for summer session and fall semester admission.

Courses

Educational Administration

7D:201 Foundations of School Administration **3 s.h.**
Introduction to organization and administration of American public education; principles and concepts of organization and administration; socioeconomic, political, and professional factors relating to education and school administration.

7D:205 Collective Bargaining in Education **3 s.h.**
Current status of public sector bargaining in the U.S. collective bargaining system through an analysis of historical, legal, and institutional perspectives; emphasis on union and management structures.

7D:210 Individualized Instruction, Foundations **arr.**
Individually designed course based on readings, special projects, and/or studies that reflect joint instructor/student interest in the area of educational foundations. Consent of adviser and instructor required.

7D:211 Individualized Instruction, Theory **arr.**
Individually designed course based on readings, special projects, and/or studies that reflect joint instructor/student interest in the area of theory. Consent of adviser and instructor required.

7D:212 Individualized Instruction, Personnel **arr.**
Individually designed course based on readings, special projects, and/or studies that reflect joint instructor/student interest in the area of personnel. Consent of adviser and instructor required.

7D:213 Individualized Instruction, Finance **arr.**
Individually designed course based on readings, special projects, and/or studies that reflect joint instructor/student interest in the area of finance. Consent of adviser and instructor required.

7D:214 Individualized Instruction, Law **arr.**
Individually designed course based on readings, special projects, and/or studies that reflect joint instructor/student interest in the area of law. Consent of adviser and instructor required.

7D:215 Individualized Instruction, Data Processing arr.
Individually designed course based on readings, special projects, and/or studies that reflect joint instructor/student interest in the area of data processing. Consent of adviser and instructor required.

7D:216 Individualized Instruction, Elementary Administration arr.
Individually designed course based on readings, special projects, and/or studies that reflect joint instructor/student interest in the area of elementary administration. Consent of adviser and instructor required.

7D:217 Individualized Instruction, Secondary Administration arr.
Individually designed course based on readings, special projects, and/or studies that reflect joint instructor/student interest in the area of secondary administration. Consent of adviser and instructor required.

7D:218 Individualized Instruction, Curriculum arr.
Individually designed course based on readings, special projects, and/or studies that reflect joint instructor/student interest in the area of curriculum. Consent of adviser and instructor required.

7D:219 Individualized Instruction, Supervision arr.
Individually designed course based on readings, special projects, and/or studies that reflect joint instructor/student interest in the area of supervision. Consent of adviser and instructor required.

7D:220 Individualized Instruction, Middle School arr.
Individually designed course based on readings, special projects, and/or studies that reflect joint instructor/student interest in the area of the middle school. Consent of adviser and instructor required.

7D:236 Administration of Students with Special Needs 3 s.h.
Foundation for and skill practice in tasks performed by directors of special education and others administering to needs of special education students, and economically and socially deprived students; for prospective school administrative personnel. Same as 7U:236.

7D:258 Contemporary Management Strategies for the Elementary Principal 3 s.h.
Strategies for the qualitative elements relating to educational program, curriculum, learning, and instruction; identification of qualitative assessment procedures as well as measurement approaches; communication techniques. Prerequisite: 7D:261.

7D:260 Contemporary Management Strategies for the Secondary Principal 3 s.h.
Strategies for the qualitative elements relating to educational program, curriculum, learning, and instruction; employment of qualitative approaches; adolescent developmental studies and psychology. Prerequisite: 7D:261.

7D:261 The Principalship 3 s.h.
Organization, supervision, and administration of schools; curriculum leadership, instructional practice, and personnel relations; role analysis, school-community relationships, and communication channels.

7D:262 School Organization Patterns 3 s.h.
Organizational approaches analyzed with specific attention devoted to emerging patterns, new trends in instructional procedures.

7D:280 Improving Instruction in the Middle School/Junior High School 3 s.h.
Instructional systems: problem, scientific, experimental, inquiry, Socratic, developmental, project, discussion, and lecture; means to assess each system; emphasis on instruction as a curricular form.

7D:285 School and Community Relationships 2-3 s.h.
Community analysis, politics and education, power groups and influences, school issues and public responses, public relations strategies.

7D:286 Politics of Education 2-3 s.h.
Formal and informal influence/power; political action at the local, state, and federal levels; organizations and bureaus; legislation, policies, rules, regulations; education-administration politics.

7D:290 Improving Instruction in the Secondary School 3 s.h.
Assessment of curriculum and instructional issues: purposes, content, delivery systems, evaluation; program and personnel assessment; in-service programs; internal consistency.

7D:291 Administration of Educational Programs and Personnel 4 s.h.
Personnel and program planning examined against statements of educational purpose; interrelationships and internal consistencies of program and staff administration from the perspectives of philosophy, psychology, learning theory, sociology, and curriculum theory.

7D:293 Individual Instruction in Educational Administration arr.
Individually designed course based on readings, special projects, and/or studies that reflect joint instructor/student interest. Consent of instructor required.

7D:294 Politics and Economics of the Governance and Financing of Public Education 3-4 s.h.
Theories, models, and research relating to educational governance and finance considered with issues in policy development, analysis, appraisal, and planning; their interrelation in American public education.

7D:295 Financial Management of Local School Systems 3 s.h.
Overview of school business administration; emphasis on fiscal management, including budgetary procedures, short- and long-range fiscal and facilities planning, and management techniques.

7D:297 Administrative Leadership Theory 4 s.h.
Perspective on administrative leadership theory drawn from social psychology, sociology, political science, communications, and business and their applications for the analysis and formulation of strategies for performing leadership functions in educational administration.

7D:298 Legal Aspects of School Personnel 3 s.h.
Teacher and student: liability, negotiations, rights, privileges, and responsibilities of school personnel; principles of law derived from court decisions; constitutional and statutory provisions; for teachers and administrators.

7D:299 Legal Aspects of School Administration 2-3 s.h.
Nonpersonnel concepts in education: organization, property, finance, religion, discrimination, and intergovernmental relations; use of constitutional and statutory provisions plus court decisions; primarily for administrators but applicable to teachers.

7D:301 Seminar: Urbanization arr.
Problems of urban centers related to education, city government, institutions; small-scale research projects developed by students; specialists in urban problems are resource people. Same as 34:279, 30:324, 44:337.

7D:303 Seminar: Administration and Coordination of Curriculum 2-3 s.h.
Intensive work in specific problems associated with the administration of curricular development, implementation, and appraisal efforts; for advanced students with prior course work in administration and curriculum.

7D:304 Seminar: Supervision and Administration 2-3 s.h.
In-depth study of issues of major significance to school organizational and instructional practice; evaluation of prior research and consideration of research proposals; for experiential supervisors and administrators. Consent of instructor required. Prerequisite: 7D:261 or equivalent.

7D:330 Impact of Law on Education: Seminar 3 s.h.
Historical precedents of the law on education; historical and current input of the courts; needs of litigants; methods to prevent litigation against schools. Same as 7U:330.

7D:360 Seminar: School Business Management Administration 1-3 s.h.
Problems of school business management with emphasis on contemporary issues; enables students to design, conduct, and analyze studies in school business management. Prerequisite: 7D:295.

7D:361 Seminar: The Economics of Education arr.
The relationship between education and economics, including supply and demand, resource allocation and productivity, educational planning, efficiency, and effectiveness. Prerequisite: 7D:294.

7D:367 Seminar: Current Issues in Special Education Administration arr.
New developments in administration; major content changes each year. May be repeated. Consent of instructor required. Prerequisite: 7D:236. Same as 7U:367.

7D:370 Research Methodology and Quantitative Analysis 4 s.h.
Approaches to research and evaluation; design variety, report style, writing, and literature review; role of cognitive and affective measures, questionnaires, interview schedules, and observational data; research and evaluation as planning activities. Prerequisite: 7P:143 or equivalent.

7D:371 Research Practicum arr.
Small-scale research projects developed and assigned; supervised experience in planning, design, management, analysis, and reporting of research activities; assignments to current and personal faculty research projects; student assumes major responsibility. Consent of instructor required.

7D:375 Educational Administration Practicum arr.
Supervised experience in working with educational administration problems including organization, planning, evaluation, and decision making.

7D:377 Seminar: Organizational Theory and Educational Administration 3 s.h.
Students select work of particular theorists or theoretical systems and develop papers for presentation and discussion. Ph.D. candidacy and consent of instructor required. Prerequisites: 7D:201 and 7D:297.

7D:380 Seminar: Value Problems in the Administration of American Education 3 s.h.
Philosophical and sociological ideas underlying the American system for administration of public education; various ideas on place of both conformity and dissent in democratic society and democratic educational system; contemporary issues.

7D:381 Analysis and Appraisal of Curriculum 2-3 s.h.
Comprehensive investigation of systematic procedures for identifying and evaluating the essential features and constituent elements of a given school district's curricular offering; for persons in administration, curriculum, and supervision programs or positions.

7D:383 Supervision and Evaluation 3 s.h.
Constructive leadership in educational organizations; analysis of research related to teacher and supervisor behaviors; evaluation procedures and behaviors that enhance leadership opportunities; positive aspects of due process and collective bargaining; for educators in administrative or supervisory roles.

7D:384 Seminar for Education Executives 0-4 s.h.
Problem solving within an organization; specific problems determined by administrators attending; for practicing school administrators.

7D:390 Selected Topics in Educational Administration arr.
Individual and group investigation of contemporary problems and issues in educational administration. Consent of instructor required. Prerequisite: 7D:201.

7D:391 Seminar: Case Studies in School Administration 2-3 s.h.
Administrative problems and issues experienced in actual school situations; construction and/or discussion of cases using theoretical models and theory; for students who have taken one other course in administration or who have had some administrative experience. Consent of instructor required. Prerequisite: 7D:201.

7D:393 M.A. Thesis in Educational Administration arr.
Supervision of the research, design, and writing of a thesis at the M.A. level provided through individual instruction. Consent of adviser required.

7D:395 Educational Specialist Research in Educational Administration arr.
Supervision of the design, research, and writing of a research project of significant quality for upper-level graduate work provided through individual instruction. Consent of adviser required.

7D:401 Field Service Project in Elementary Administration arr.
Individual project based in a school setting with emphasis on elementary administration; under instructor's approval and supervision. Consent of instructor required.

7D:402 Field Service Project in Secondary Administration arr.
Individual project based in a school setting with emphasis on secondary administration; under instructor's approval and supervision. Consent of instructor required.

7D:403 Field Service Project in Special Education Administration arr.
Individual project based in a school setting with emphasis on special education administration; under instructor's approval and supervision. Consent of instructor required.

7D:404 Field Service Project in Central Administration arr.
Individual project based in a school setting with emphasis on central administration; under instructor's approval and supervision. Consent of instructor required.

7D:493 Ph.D. Thesis in Educational Administration arr.
Supervision of the research, design, and writing of a thesis at the Ph.D. level provided through individual instruction. Consent of adviser required.

Social Foundations of Education

7F:102 History of American Education 2-3 s.h.
Survey of American educational history, with emphasis on conflicting historical interpretations of pivotal events and educational movements; contemporary reform efforts examined in historical perspective.

7F:104 Education in the Third World 2-3 s.h.
Educational implications of various development issues, including the role of the media, and multinational corporations and foreign aid; educational dilemmas currently facing Third World governments.

7F:107 History of Western Education 2-3 s.h.
Educational philosophies of significant individuals in the history of education and the relevance of their ideas in terms of contemporary educational practice in the United States.

7F:117 Philosophies of Education 2,3,5 s.h.
Introductory survey of the principal educational philosophers and philosophies that have influenced Western education; emphasis on how philosophical ideas and conflicts have shaped the educational scene.

7F:120 Politics of Education 2-3 s.h.
Introduction to the political setting of education at several levels—federal, state, and local—and consideration of factors that condition internal school and district politics. GER: social sciences.

7F:130 Educational Sociology 2-3 s.h.
Macrosociological perspective of the role of education in social systems; impact of formal education on social stratification, social mobility, and economic achievement in the United States and selected countries.

7F:134 Education and the World of Work 2-3 s.h.
Relationship between education and work at the levels of individual and organizational behavior; relationship between educational and economic systems; sources include economics, psychology, sociology, and education. Same as 7H:134.

7F:135 John Dewey and Education 2-3 s.h.
Dewey's philosophy of "instrumentalism," with emphasis on his theories of knowledge, valuation, and aesthetics, especially as applied to educational theory and practice.

7F:145 Education of Immigrants and Refugees 2-3 s.h.
Study of adjustment of recent refugees and immigrants in American schools; emphasis on research related to ethnocentric transition, differential rates of acculturation, and analysis of the problems of ethnic differences.

7F:154 Education, Race, and Ethnicity 2-3 s.h.
The role of education in ethnic and racial stratification in the United States and other nations; influence of variations in the family structure, stratification patterns, and institutional constraints in the formation of educational aspirations and achievement levels.

7F:170 Survey Research and Design 3 s.h.
Types of survey instruments; ethical issues; sampling problems; logging, collecting, and cleaning procedures; construction and administration of social survey to a select population on a topic of current interest; detailed examination of techniques of questionnaire construction. Same as 7P:155.

7F:180 Human Relations for the Classroom Teacher 3 s.h.
Social factors such as discrimination, diversity, equity, racism, sexism, and ethnic and socioeconomic pluralism and their influence on American schools and classrooms; for teacher education candidates.

7F:205 Research Process and Design 3 s.h.
Introduction to research process, with emphasis on the development of critical thinking and research skills; analysis of selected recent research in the field; students draft a research problem. Same as 7H:205.

7F:210 Education and Social Change 2-3 s.h.
Focus on the role of educational institutions, in connection with political and economic structures, in the process of social change; illumination of theories of social change through case studies of educational systems in both less developed and industrialized nations.

7F:215 Seminar: Theory and Practice of Leadership 2-3 s.h.
Theory-based literature and critiques of leadership as presented in various literary genres such as biography, novels, plays, poetry, and philosophical treatises.

7F:220 History and Philosophy of Postsecondary Education 3 s.h.
Major themes and developments in American higher education; ideologies, people, and movements that have particularly influenced those developments. Same as 7H:220.

7F:225 Education and Public Policy 2-3 s.h.
Same as 7H:225.

7F:240 Topics in Social Foundations of Education arr.
Seminar for intensive study of one problem, issue, or work field. May be repeated.

7F:275 Development Policy and Planning in the Third World 3 s.h.
Cross-cultural and interdisciplinary analysis of problems associated with urbanization and development in the developing nations. Same as 113:275, 6E:234, 42:275, 44:275, 34:275, 102:275.

7F:293 Individual Instruction in Social Foundations of Education arr.
Consent of instructor required.

7F:304 American Contribution to Educational Philosophy 2 s.h.
American philosophy and its influence on American public education.

7F:306 Education in China 2-3 s.h.
Educational development in modern China from social, political, and literary perspectives; analysis of post-1949 educational policy shifts.

7F:311 Seminar: Research Topic in Higher Education 2-3 s.h.
Topic submitted by students or faculty. May be repeated. Same as 7H:311.

7F:316 Policy, Planning and Implementation in Education 2-3 s.h.
Same as 7H:316.

7F:360 Seminar: History and Philosophy of American Higher Education 3 s.h.
Organizational culture related to development of social, intellectual, and institutional life in the United States; effects on present and future of higher learning in the United States; comparative analysis. Prerequisite: 7F:220 or consent of instructor. Same as 7H:360.

7F:493 Ph.D. Thesis arr.
Consent of instructor required.

Postsecondary and Continuing Education

7H:93 Individual Study: Higher Education arr.
Consent of instructor required.

7H:100 Issues and Policies in Higher Education 3 s.h.
Introduction to current selected functions, issues, and policies of American higher education.

7H:110 Introduction to Continuing Education 3 s.h.
Historical, philosophical, and social influences on the scope, functions, and trends of continuing education in the United States.

7H:112 Teaching of Adults 3 s.h.
Problems associated with adults in the learning role; recognized variations in teaching techniques for adults.

7H:117 Foundations of Vocational Education 2-3 s.h.
Study of vocational education programs, with special emphasis on federal and state programs, educational services, career development, job satisfaction, and changing needs of business and society.

7H:134 Education and the World of Work 2-3 s.h.
Same as 7F:134.

7H:171 The Community College 2-3 s.h.
Character of the community college as a postsecondary institution; functions, students, faculty, control, financing, administration, and historical evolution.

7H:172 Supervision and Evaluation of Post-Secondary Employees 2 s.h.
Knowledge, skills, and attitudes of the evaluator in institutions of higher education; orientation, pre- and post-observation conferences, legal contexts, and growth planning.

7H:173 Iowa Community College Workshop 0-1 s.h.
Great Teachers Workshop enables teachers to share ideas and resources, facilitating personal and professional growth.

7H:175 Post-High School Staff Development Workshop 0-2 s.h.
Administrative Dimensions Workshop provides an environment where community college administrators can share knowledge and experiences.

7H:190 Seminar: Health Occupations Education 1-3 s.h.
Current trends and topics in health occupations education: instruction evaluation, legislation, licensure, professionalism; students and faculty submit topics for consideration. May be repeated.

7H:191 Community College Teaching Internship arr.
Full academic term of supervised one-half-time teaching at a community college; concurrent assignment to gain knowledge of institution policies and procedures; role of professional associations.

7H:192 Curriculum Development: Application to Community College and Health Careers 3 s.h.
Comprehension of a rational curriculum process common to education in general, and its application to community college and health careers.

7H:193 Evaluation: Application to Community College and Health Careers 2-3 s.h.
Methods for educational evaluation in community college programs, including teaching and program evaluation; emphasis is on achievement testing.

7H:199 Topics in Higher Education arr.
Students and faculty submit topics for consideration. May be repeated.

7H:200 Administration of Student Services 3 s.h.
Principles and practices of administration and leadership in the field. Recommended: 7H:100.

7H:205 Research Process and Design 3 s.h.
Introduction to the research process, with emphasis on the development of critical thinking and research skills; analysis of selected recent research in the field; students draft a research problem. Same as 7F:205.

7H:216 Finance in Higher Education 2-3 s.h.
Analysis and appraisal of research and issues related to public and private funding of higher education; costs, benefits, outcomes, and resource management.

7H:218 The Law and Higher Education 2-3 s.h.
The role of law as it affects postsecondary institutions; analysis of the case law in specific areas of concern to administrators, faculty, staff, and students.

7H:220 History and Philosophy of Postsecondary Education 3 s.h.
Major themes and developments in American higher education; ideologies, people, and movements that have particularly influenced those developments. Same as 7F:220.

7H:222 Introduction to Planning, Policy Analysis, and Evaluation 3 s.h.
Basic theories and techniques; emphasis on academic and related educational policy issues.

7H:224 Organizational Theory and Administrative Behavior 3 s.h.
Theories and concepts of organizational behavior applied in structural, organizational, and administrative contexts of American higher education.

7H:225 Education and Public Policy 2-3 s.h.
Policy process; emphasis on related literatures of organizational theory and policy analysis; critical analysis of problems and sources of variation in policy development and decision processes. Same as 7F:225.

7H:226 Higher Education Management 2-3 s.h.
Variables that influence the decision-making process in American higher education; application oriented, involving analysis of students' own administrative skills. Prerequisite: background in organizational and administrative theory or consent of instructor.

7H:250 Administration of Technical-Educational Programs 2-3 s.h.
Administrator's role in relating education to work; consideration of legal, financial, and staffing aspects of vocational-technical education; student and employer needs.

7H:251 Development of Continuing Education Programs 3 s.h.
Theories applied in developing and delivering continuing education programs; characteristics of populations to be served; marketing potential of cooperatively planned programs; assessing educational needs, instructional resources and staffing, support services, budgeting, and evaluation.

7H:261 Problems and Issues in Continuing Education 2 s.h.
Perspectives; institutional roles; interrelationships between youth and adult education; process, program, and potential of field.

7H:270 Intern Seminar arr.
Prepares students to assume faculty roles in a community college setting; emphasis on methods of course planning, instruction, evaluation; current issues and legal aspects.

7H:293 Individual Instruction in Higher Education arr.
Consent of instructor required.

7H:295 Master's Project arr.
Research for the nonthesis program; topic to be approved by adviser.

7H:310 Seminar: Education for the Professions 2-3 s.h.
Characteristics of the professions and their educational implications, the role of theory and practice, clinical experiences; students analyze education for a selected profession.

7H:311 Seminar: Research Topic in Higher Education 2-3 s.h.
Topic submitted by students or faculty. May be repeated. Same as 7F:311.

7H:312 Seminar: Continuing Education 2 s.h.
Nature, scope, and trends of research as a dimension of continuing education. Consent of instructor required.

7H:315 Curriculum Development in Higher Education 2-3 s.h.
Basic educational models and techniques of design and implementation appropriate to the development of educational programs.

7H:316 Policy, Planning and Implementation in Education 2-3 s.h.
Review of research, applications. Same as 7F:316.

7H:317 Administrative Decision-Making in Higher Education 2-3 s.h.
Analysis of administrative problems and cases in higher education; emphasis on the culture of the organization. Prerequisite: 7H:224 or 7H:226 or consent of instructor.

7H:333 Practicum in Higher Education arr.
Consent of instructor required.

7H:360 Seminar: History and Philosophy of American Higher Education 3 s.h.
Organizational culture analyzed and related to development of social, intellectual, and institutional life in the United States; effects on the present and future of higher learning in the United States; comparative analysis. Prerequisite: 7H:220 or consent of instructor. Same as 7F:360.

7H:370 College Teaching Internship arr.
One semester of supervised one-half-time teaching at a community college; concurrent assignments to gain knowledge of institution governance and procedures. May be repeated. Consent of adviser required.

7H:395 Educational Specialist Research in Higher Education arr.
Supervision of the design, research, and writing of a research project for Ed.S. candidates. Consent of instructor required.

7H:401 Proseminar in Higher Education 1-2 s.h.
Current topics and major areas of professional and research interest. For Ph.D. majors in higher education. May be repeated. Consent of instructor required.

7H:493 Ph.D. Thesis in Higher Education arr.
Consent of instructor required.

PSYCHOLOGICAL AND QUANTITATIVE FOUNDATIONS

Chair: Leonard S. Feldt
Professors: Elizabeth M. Altmaier, T. Anne Cleary, Margaret M. Clifford, Ursula M. Delworth, Leonard S. Feldt, Robert A. Forsyth, Hiram D. Hoover, Lowell A. Schoer, Bill Carl Snider, Gerald L. Stone
Professors emeriti: Gordon N. Cantor, William E. Coffman, Albert N. Hieronymus, Siegmar Muehl, Lawrence M. Stolurow
Associate professors: Stephen M. Alessi, Timothy N. Ansley, Barry D. Bratton, Charles D. Claiborn, Carl S. Davis, Stephen B. Dunbar, Stewart W. Ehly, Richard Elardo, Nancy Ewald Jackson, David A. Frisbie, Kathryn C. Gerken, Craig L. Gjerde, Henrietta L. Logan, David F. Lohman, William B. Oglesby, Thomas R. Rocklin, Cathy M. Roller
Associate professor emerita: Lida C. Cochran
Adjunct associate professors: Mark A. Albanese, E. James Maxey
Assistant professors: Timothy L. Phillips, Donald Pope-Davis, Audrey Qualls-Payne, Kathleen M. Tessmer, Walter P. Vispoel, Donald B. Yarbrough
Adjunct assistant professors: Robert L. Brennan, Cynthia Druva-Roush, Richard L. Ferguson, Jerry S. Gilmer, Deborah J. Harris, Michael J. Kolen, Philip R. Laughlin
Adjunct assistant professor emeritus: Calvin R. Stevenson
Instructors emeriti: Elizabeth J. Forell, Calvin E. Mether
Lecturers: G. John Achrazoglou, William E. Martin, Jr.
Degrees offered: M.A., Ed.S., Ph.D.

The division offers programs in five areas: educational measurement and statistics, counseling psychology, educational psychology, school psychology, and instructional design and technology. There are two general goals of these programs: to help students acquire the knowledge and skills necessary to function effectively in settings that require the application of psychological and quantitative principles, and to extend knowledge and understanding of the teaching/learning process as it occurs in a variety of settings. The major emphasis in the M.A. and Ed.S. programs is on the first of these goals; that in the Ph.D. programs is on the second. However, there is some emphasis on both goals in all programs.

Undergraduate Course Work

The division offers an undergraduate minor in the combined areas of educational psychology, measurement, and statistical analysis.

The purpose of the minor is to provide an enriched background in educational psychology, educational testing, and research methods in education. A division adviser selected by the student aids in choosing courses totaling 18 or more semester hours, of which 12 semester hours must be in 100-level courses. This minor does not lead to certification as a public school teacher.

One of the General Education Requirements for graduation from the College of Liberal Arts is successful completion of a course designed to develop skills in quantitative or formal reasoning (see the "College of Liberal Arts" section of the *Catalog*); 7P:25 Elementary Statistics and Inference may be used to satisfy this requirement.

Graduate Programs

Educational Measurement and Statistics

Master of Arts

The M.A. degree in this field prepares students for positions that require a basic knowledge of educational testing, program evaluation, and data analysis. Such positions occur in research centers, testing organizations, large school systems, and state education agencies. The program is also appropriate for students who seek to broaden their knowledge of measurement and research methodology for personal development.

Admission

Grade-point average requirements for admission to the program are the same as those established by the Graduate College. Applicants whose score for the quantitative, verbal, or analytical section of the Graduate Record Examination (GRE) General Test is less than 500 typically are not admitted. However, if the applicant does not speak English as the native language and there is offsetting evidence of superior ability, the faculty may adjust the GRE admissions requirement. Applicants should have at least one course in college mathematics. Some work experience as a teacher or researcher is highly desirable. The faculty reviews applications as they are received.

Requirements

The degree may be taken without thesis (32-semester-hour minimum) or with thesis (minimum of 28 semester hours of course work plus 2-4 semester hours of thesis credit). All students must complete a core of courses totaling approximately 26 semester hours. Included in this core are a graduate-level survey course in educational

psychology, elementary and intermediate courses in statistical methods, a course in educational research methodology, and courses in the development and use of evaluation instruments.

The six hours of final comprehensive examinations typically include three-hour examinations in educational measurement and in applied statistics. With the approval of the M.A. committee, the student may take two-hour examinations in these fields plus a two-hour examination in educational psychology or a substitute area. Three-hour examinations assume a minimum of three courses in the area; two-hour examinations assume a minimum of two courses in the area.

Doctor of Philosophy

This doctoral program prepares students for senior professional positions in the fields of educational measurement, program evaluation, and statistical methods. Such positions generally are found in colleges and universities, state departments of education, large public and private school systems, testing agencies, and research centers.

Admission

Applicants for admission to the program must hold an M.A. degree from an accredited institution. The grade-point average requirement is the same as that for the Graduate College. If an applicant's scores on the verbal, quantitative, or analytical sections of the Graduate Record Examination (GRE) General Test are lower than 500 and there is no offsetting evidence of superior ability, the applicant will be rejected. However, the faculty may adjust the GRE standards for students who do not speak English as their native language. Students who expect to concentrate in the area of statistics should have training in college mathematics through differential and integral calculus. The absence of such training is a deficiency that must be made up during the first year of residence. At least one year of professional experience in teaching, research, or a related field is highly desirable. The faculty reviews applications as they are received.

Requirements

In addition to the substantive courses in educational measurement and statistics offered by the division, all students must complete the following related courses.

22C:100 Introduction to Computing with FORTRAN (or equivalent)	2 s.h.
7P:131 Educational Psychology	3 s.h.
7P:220 Educational Research Methodology	3 s.h.
7C:254 Appraisal in Counseling	3 s.h.

The student's adviser specifies additional course work in areas appropriate to the student's interests and vocational objectives. These courses typically include additional work in educational psychology and courses offered by other College of Education divisions and University departments.

Students who concentrate in the area of statistics, with the intention of teaching on the college level, are required to take courses in the mathematical theory of statistics. Those who concentrate in the area of educational measurement and evaluation are advised to take courses in curriculum, counseling, and higher education. All students must develop familiarity with computer-programming techniques and statistical analysis programs.

Candidates who enter the program without completing an M.A. thesis must complete a substitute project approved by three members of the division faculty. The project must be completed before the Ph.D. comprehensive examinations may be written. A minimum of 90 semester hours is required for the degree, including 12 or more semester hours of thesis credit.

The record of every student admitted to the program is reviewed after completion of approximately 18 semester hours of course work. The division faculty considers course grades, evidence of critical and analytical skills, development since admission to the program, and promise for continued growth. Students who show insufficient potential or deficiencies that cannot be remedied are dropped from the program.

Following completion of the major portion of their course work, candidates must write comprehensive examinations. Typically, these consist of three three-hour written examinations over the fields of applied statistics, educational measurement, and educational psychology or an approved substitute area. A substitute area is generally one in which the candidate has at least 9 semester hours of course work. In lieu of one written examination, the student's committee may assign a project involving analytical and evaluative skills, or research creativity. The written examinations are followed by an oral examination in which the committee members may seek further evidence of the candidate's command of the three fields. A single decision is rendered on all aspects of the comprehensive examinations.

Counseling Psychology

Doctor or Philosophy

The doctoral program in counseling psychology was granted full approval by the American Psychological Association in 1983. Accreditation was renewed in 1988.

The program goal is to prepare doctoral level counseling psychologists who will promote psychology as a science and contribute to the advancement of the profession. No master's degree is offered in counseling psychology. The faculty endorses a scientist/practitioner model of training and expects students to become competent researchers and proficient clinicians. Graduates find positions in higher education, counseling centers, clinics, and private practice settings.

Admission

Applications are complete when the following items have been received:

- Graduate College application form;
- Official transcripts of all previous undergraduate and graduate work;
- Official report of Graduate Record Examination General Test scores; GRE Advanced Test in Psychology is encouraged but not required;
- Personal statement outlining career goals and reasons for seeking advanced training as a counseling psychologist;
- Three letters of recommendation from persons in a position to assess the applicant's potential for completing the doctoral program.

The faculty gives preference to applicants who meet the following criteria: undergraduate grade-point average above 3.00 (where A = 4.00); graduate grade-point average above 3.50; and GRE General Test score (verbal plus quantitative) above 1200; undergraduate major, minor, or substantial course work in psychology; previous research and counseling experience. However, the faculty welcomes applications from persons of varying backgrounds and types of academic preparation. A maximum of eight students is accepted each year.

The deadline for completed applications is January 15. Admissions decisions are made by March 15. All students must begin the program in the fall semester after admission.

Requirements

Basic Psychology

All students are required to have a thorough grounding in the basic discipline of psychology. This may be achieved through a minimum of 3 semester hours of credit in each of the following five areas (a total of at least 15 semester hours): biological bases of behavior, cognitive-affective bases of behavior, social bases of behavior, individual differences, and history and systems.

Statistics and Research Design

7P:243 Intermediate Statistical Methods	4 s.h.
7P:246 Design of Experiments	4 s.h.
or	
7P:244 Correlation and Regression	3 s.h.
7P:257 Educational Measurement and Evaluation	3 s.h.
Total	10-11 s.h.

Counseling Psychology Core

7P:223 Pre-Practicum in Counseling Psychology	3 s.h.
7P:225 Pro-Seminar in Counseling Psychology	3 s.h.
7P:235 Issues of Cultural Diversity	3 s.h.
7C:255 Vocational Psychology	3 s.h.
7P:305 Psychotherapy I: Dynamic and Phenomenological Approaches	3 s.h.
7P:310 Psychodiagnostics	3 s.h.

7P:356 Processes and Outcomes in Counseling and Psychotherapy	3 s.h.
7P:365 Psychotherapy II: Cognitive and Behavioral Approaches	3 s.h.
7P:465 Issues and Ethics in Professional Psychology	3 s.h.
7P:434 Practicum in Counseling Psychology	3 s.h.
7P:453 Advanced Practicum in Counseling Psychology (may be repeated)	3-9 s.h.
Total (minimum)	33 s.h.

Students must enroll in practica to reach a specified level of client contact, supervision, and additional experience hours. At least one practicum must be served at the University Counseling Service. Placements other than the University Counseling Service must have prior approval of the counseling psychology faculty. Students must successfully complete at least one semester of 7P:434 Practicum in Counseling Psychology before enrolling in 7P:453 Advanced Practicum in Counseling Psychology. Waivers of practicum requirements may be granted under special circumstances by a majority vote of the Counseling Psychology faculty.

Other Requirements

A minor area of specialization is planned individually in collaboration with the doctoral student's major and minor advisers. Elective courses are determined in collaboration with the major adviser.

A research project equivalent to the master's thesis must be completed prior to the comprehensive examinations. Up to 6 semester hours of credit may be applied to this project. The dissertation research study is planned in collaboration with the doctoral student's major adviser. Dissertation credit can range from 12 to 15 semester hours.

Students spend a calendar year at an internship setting approved by the Counseling Psychology faculty. The faculty determines student readiness to apply for the internship based on completion of all or almost all required course work, successful completion of the master's equivalency research requirement, and successful completion of practicum requirements.

Comprehensive Examinations are written in four areas: counseling psychology theory, counseling psychology research, counseling psychology practice, and a minor area. It is strongly recommended that students complete comprehensive examinations prior to the internship.

Students must show appropriate levels of emotional balance and interpersonal skills and act within the American Psychological Association's Ethical Principles of Psychologists.

Educational Psychology

Master of Arts

This program provides an overview of educational psychology as an area of scholarly inquiry. It includes course work in human development, cognition/learning, motivation, socialization/personality, educational measurement, and research methods. The program does not prepare students for entry into a specific vocation. Rather, it contributes to a broad understanding of the psychological principles on which education builds.

Admission

Admissions requirements are the same as those established by the Graduate College. Teaching experience is desirable but not required. The faculty reviews applications as they are received.

Requirements

Students may take the degree with or without thesis. The degree without thesis requires a minimum of 32 semester hours of course work; with thesis, it requires a minimum of 28 semester hours of course work plus 2-4 semester hours of thesis credit. Both programs require 7P:143 Introduction to Statistical Methods or the equivalent. Students who intend to apply for admission to the Ph.D. program should take the M.A. degree with thesis.

Students plan the remainder of the program in consultation with their advisers, choosing courses from the following four areas: human development, cognition/learning, motivation, and socialization/personality. Students must take at least one course in each of these areas. The faculty encourages degree candidates to enroll in at least two courses outside the division.

The record of every student admitted to the program is reviewed near the end of the second semester in residence. The program faculty considers course grades, evidence of critical and analytical skills, development during the year, and promise for continued growth. Deficiencies identified in the review are discussed with the student. Students may be dropped from the program at the discretion of the faculty.

The program culminates in six hours of comprehensive examinations consisting of either three two-hour or two three-hour exams. The three-hour exam calls for a minimum of three courses in each area tested. The two-hour exam calls for a minimum of two courses in each area tested. The comprehensive exam is planned jointly by the student and adviser and must be approved by the M.A. committee.

Doctor of Philosophy

This doctoral program prepares graduates for a variety of careers that share a concern for the application of psychological principles to educational practices. Such careers include professorships at the university and college level and research or administrative positions in educational agencies, clinics, hospitals, testing organizations, and public schools.

Admission

An applicant for admission to the program must hold an M.A. degree from or be an M.A. degree candidate in good standing at an accredited institution. Applicants whose M.A. degree is not directly relevant to educational psychology may be admitted conditionally. The student must complete the M.A. program before taking the Ph.D. comprehensive exams.

The graduate grade-point average requirement for admission is the same as that established by the Graduate College. Applicants are expected to have earned scores of 500 or higher on both the verbal and quantitative sections of the Graduate Record Examination General Test. Candidates may be admitted conditionally on the basis of other evidence, such as high grade-point average, strong academic preparation, and highly supportive recommendations. Applications are reviewed as received.

Requirements

The program requires a minimum of 72 semester hours beyond the bachelor's degree and encompasses four substantive areas—human development, cognition/learning, motivation/socialization/personality, and individual differences. Students must complete at least one course in each of the four areas, with three of these courses above the 100 level. In addition, students must demonstrate substantial competence in at least one of these areas. A minimum demonstration of competence requires the successful completion of a three-hour comprehensive exam based on no fewer than 6 semester hours in courses above the 100 level.

Additional requirements include the following: 7P:220 Research Methodology; a minimum of 6 semester hours of 200-level course work in statistics and one graduate-level course in measurement; and 10 semester hours of Ph.D. thesis credit. Alterations in these requirements can be made for individual students with the approval of a committee composed of three members of the educational psychology faculty. Students are encouraged to take course work outside the College of Education in their area of interest. Candidates who took the M.A. degree without thesis must undertake a project in lieu of the thesis. This project must be approved by three members of the educational psychology faculty. The candidate's program is planned jointly by the student and the adviser.

The record of every student admitted to the program is reviewed near the end of the second semester of residence. The program faculty considers course grades, evidence of critical and analytical skills, development during the year, and promise for continued growth. Deficiencies identified in the review are discussed with the student. Students may be dropped from the program at the discretion of the faculty.

After candidates have completed the major portion of their course work, they must write comprehensive examinations. Six of the nine hours of comprehensive

examinations must be based on course work in educational psychology offered by the division or on closely related course work offered by other University departments. A comprehensive examination taken outside the educational psychology program must be planned in consultation with the adviser. The proposed examination schedule must be approved by the comprehensive examination committee.

School Psychology

Specialist in Education

The Ed.S. program provides course work and supervised field experience in the areas of education and psychology, enabling graduates to qualify for certification as school psychologists (State of Iowa Endorsement 40).

Admission

Undergraduate preparation in psychology or education is desirable but alternative backgrounds are considered. Qualifications include undergraduate grade-point average above 3.00, Graduate Record Examination General Test scores above 500 in the verbal and quantitative areas, strong letters of recommendation, and a demonstrated interest in working with children. Application and supporting materials must be submitted by February 1 for consideration for fall admission. Decisions are made by March 15. Up to five students are admitted per year.

Requirements

The program requires a minimum of 60 semester hours. The plan of study includes courses in psychological foundations, psychoeducational foundations, school psychology, and research methods. Degree requirements include a written comprehensive examination and a research paper prepared in conjunction with course 7P:395 Educational Specialist Research (4 semester hours).

Doctor of Philosophy

The Ph.D. program in school psychology prepares students for positions in higher education and for consultative, supervisory, research, and administrative positions in public and private agencies.

Admission

Preference is given to applicants with undergraduate majors in psychology or education, grade-point averages above 3.00, and verbal and quantitative scores above 500 on the Graduate Record Examination General Test. The faculty also encourages applications from school psychologists with M.A. or Ed.S. degrees.

Applications must include three letters of recommendation and a personal statement of interest and goals. Complete application materials, including transcripts and test scores, must be received by February 1 for consideration for fall admission. Decisions are made by March 15. A maximum of five students are admitted to the program each year.

Requirements

The program requires a minimum of 90 semester hours. Course work is chosen from four areas: psychological foundations, psychoeducational foundations, school psychology, and research methods. The course of study is developed by the student and the academic adviser. Students are required to write comprehensive examinations, carry out a research project equivalent in scope to an M.A. thesis, serve an internship, and complete a doctoral dissertation through enrollment for a minimum of 10 semester hours in 7P:493 Ph.D. Thesis in Psychological and Quantitative Foundations.

Instructional Design and Technology

Master of Arts

The M.A. in instructional design and technology provides students with the basic knowledge and skills to work in educational and training environments such as schools, business and industry, health care, government, and consulting agencies. The program consists of 35 semester hours of course work and may be completed with either a thesis or a project.

Admission

Regular admission requires a minimum grade-point average of 2.70 on all previous course work and a score of 500 or higher on both the quantitative and verbal sections of the Graduate Record Examination General Test. If these requirements are not met but there is compelling evidence of superior ability, a conditional admission may be granted. Regardless of the admission status, all students are expected to attain a grade-point average of at least 3.00. Applicants are encouraged to include with the application a personal statement about their interest in the field.

Applications for fall admission must be received by May 1; for spring admission, by October 1; for summer admission, by March 1. Admissions decisions are announced approximately one month after the application deadlines.

Requirements

The degree requires the following core courses (or approved equivalents):

7W:120 Introduction to Instructional Design and Technology
7W:103 Selection and Use of Media for Instruction
7W:105 Design and Production of Media for Instruction
7P:107 Psychological Bases of Instructional Design
7P:150 Introduction to Educational Measurement

7W:220 Advanced Instructional Design and Technology
or
7W:222 Instructional Strategies

Students plan the remainder of their study program in consultation with their adviser, choosing course work in one of the following emphasis areas: classroom instruction, computer applications, instructional development, health science education, training and development, media production, or school media. Students who have not had previous experience in designing instruction or training must complete a practicum experience. A final project or thesis is required. If the degree is done with a thesis, 7P:143 Introduction to Statistical Methods or 7W:269 Survey of Research in Instruction Design and Technology is required.

The program culminates with a six-hour set of comprehensive examinations based on core and emphasis area courses. The examinations are divided into two- or three-hour parts as follows: general instructional design, 2-3 hours; area of emphasis, 2-3 hours; other, 0 or 2 hours.

Specialist in Education

The Educational Specialist program in instructional design and technology consists of 60 semester hours of course work beyond the bachelor's degree. The Ed.S. is usually considered a final degree.

Admission

Regular admission requires a grade-point average of at least 3.00 on all previous course work and a score of 500 or higher on both the quantitative and verbal sections of the Graduate Record Examination General Test. If these requirements are not met but there is compelling evidence of superior ability, a conditional admission may be granted. Regardless of the admission status, all students are expected to maintain a 3.20 grade-point average. Applicants are encouraged to discuss their plans with a faculty member and to include a personal letter with the application describing their interests in the instructional design and any additional information that may be helpful in the admissions process.

Applications for fall admission must be received by May 1; for spring admission, by October 1; for summer admission, by March 1. Admissions decisions are announced approximately one month after the application deadlines.

Requirements

Course work required for the degree includes the master's level core courses (or equivalent), three research methods courses (7P:143 Introduction to Statistical Methods, 7P:220 Educational Research Methodology, 7W:269 Survey of Research in Instructional Design and Technology, or equivalents), and 18 semester hours of study in one area: classroom instruction, computer applications, instructional development, health sciences education, training and development, media production or school media. In addition,

the student must complete 6 semester hours of course work in a cognate area outside the College of Education. Students who have not had previous experience in designing instruction or training are required to complete a practicum.

The program culminates with the completion of a final project and a six-hour set of comprehensive examinations based on courses in the core, research, and emphasis areas. The examinations are divided into two or three parts as follows: general instructional design, 2-3 hours; area of emphasis, 2-3 hours; other, 0 or 2 hours.

Doctor of Philosophy

The Ph.D. program in instructional design and technology provides a broad background for persons interested in teaching, research, and leadership positions. The 90-semester-hour program emphasizes the acquisition of knowledge and skills needed to expand the understanding of instruction and training and their effects on learning and performance.

Admission

Admission to the program is competitive. Basic requirements are a grade-point average above 3.20 on previous course work and a score of 500 or higher on both the quantitative and the verbal sections of the Graduate Record Examination General Test. Other factors considered are the nature of previous courses and experiences, language proficiency, and letters of recommendation. Applicants must include a personal letter with the application, describing their interests in the instructional design field, the Iowa program, and any additional information that may be pertinent. Potential applicants are strongly encouraged to discuss their plans with a faculty member.

Applications for fall admission must be received by May 1; for spring admission, by October 1; for summer admission, by March 1. Admissions decisions are announced approximately one month after the application deadlines.

Requirements

Course work required for the degree includes the core of the M.A. program or equivalents, five research-related courses (including three in methods of research), and 21 semester hours in one specialized area: instructional development, computer applications, health sciences education, or training and development. In addition, students must complete 9 semester hours of course work in a cognate area outside the College of Education.

Near the end of the course work requirements, students must submit a formal paper that reflects their ability to organize and present a topic at the conceptual level expected for the dissertation. The completed paper must be approved by a faculty committee before the comprehensive examination may be taken.

All students must successfully pass a nine-hour set of comprehensive examinations that include the core, research, and specialized courses as follows: general instructional design, 3 or 5 hours; area of specialization, 3 or 4 hours; other, 0 or 3 hours.

The program culminates with the successful preparation and defense of a dissertation.

Financial Aid

The division normally employs several advanced graduate students as teaching, research, and production assistants. The appointments are typically half-time for the academic year, and holders are permitted to carry a study and/or research load of up to 12 semester hours per semester. Candidates should address inquiries to the chair of the division.

Other types of graduate assistantships are supported by the Iowa Testing Programs. Duties are varied, including responsibilities such as test development, test norming, and data analysis. There are also a few other assistantships supported by the Iowa Testing Programs that are not specific to the programs cited above. Inquiries should be directed to the program directors.

Courses

Psychology, Measurement, Statistics

7P:25 Elementary Statistics and Inference **3 s.h.**
Graphical techniques for presenting data; descriptive statistics; sampling distribution models; logic of statistical inference; interval estimation procedures; tests of significance; correlation and prediction. GER: quantitative or formal reasoning. Prerequisite: 22M:1 or equivalent. Same as 22S:25.

7P:75 Educational Psychology and Measurement **3 s.h.**
Principles of cognitive and social development, learning, memory, problem solving, individual differences, testing, and classroom management; their relationship to education.

7P:80 Psychology of Academic Learning **3 s.h.**
Theory and practice for improving reading skills, learning, and personal adjustment; development of study skills.

7P:102 Human Abilities **3 s.h.**
Survey of research on individual differences in aptitude and achievement; emphasis on abilities required by or developed through conventional forms of schooling. Prerequisites: 7P:75 or equivalent, and 7P:150.

7P:106 Child Development **3 s.h.**
Developmental norms; roles of heredity and environment; learning and motivational processes; intellectual and personality development; child rearing practices.

7P:107 Psychological Bases of Instructional Design **3 s.h.**
Same as 7W:107.

7P:109 Socialization of the School-Age Child **3 s.h.**
Factors influencing the process of socialization; emphasis on those most relevant for education.

7P:111 Introduction to Human Motivation **3 s.h.**
An overview of human motivation theories and issues; practical implications of research findings and relationships between motivation, learning, and performance.

7P:131 Educational Psychology **3 s.h.**
Psychology of the teaching/learning process; developmental concepts, social processes, language and thought; individual differences in abilities and achievements; theory and research on reading, writing, mathematics, thinking, studying, and other topics in instructional psychology.

7P:133 The Adolescent and Young Adult **3 s.h.**
Introduction to psychological and social aspects of adolescence and young adulthood; emphasis on theory, research, and practical applications.

7P:134 Parent-Teacher Communication **1-3 s.h.**
Realities of working with parents; interpersonal skills; options for parent support services. Same as 7E:134, 7U:134.

7P:143 Introduction to Statistical Methods **3 s.h.**
Analysis and interpretation of research data; descriptive statistics; introduction to probability, sampling theory, and statistical inference (binomial, normal distribution, and t-distribution models); linear correlation and regression. Same as 22S:102, 31:143.

7P:148 Bayesian Statistics 1 **3 s.h.**
Theory and practice of Bayesian statistical analysis; comparison of Bayesian and classical paradigms; Bayesian versions of classical concepts such as confidence intervals, hypotheses tests, sufficiency, and central limit theorem; emphasis on noninformative priors, computational approximations, hierarchical models, and robustness. Prerequisite: 22S:120 or equivalent. Same as 22S:138.

7P:150 Introduction to Educational Measurement **3-4 s.h.**
Test construction techniques, item writing, analysis of item and test characteristics for norm- and criterion-referenced tests; considerations in selection and use of standardized achievement and aptitude tests; no background in statistics is assumed.

7P:155 Survey Research and Design **3 s.h.**
Same as 07F:170.

7P:160 Standardized Testing and Public Policy **2 s.h.**
Analysis of the history and current status of psychometric models of test bias and fair selection; standards developed by professions for test use; court decisions, federal legislation, and administrative guidelines on employee selection and educational assignment. Prerequisite: 7P:257 or equivalent.

7P:169 Introduction to Personality **3 s.h.**
Overview of theory and research on individual differences in personality; special attention to the role of personality in learning and cognitive performance.

7P:170 Introduction to Psychology of Reading **3 s.h.**
Psychological and linguistic analysis of the reading process; implications for teaching methods and materials; factors related to reading performance.

7P:176 Psychology of Writing **3 s.h.**
The writing process compared and contrasted with speaking, listening, and reading; topics include theoretical models of the writing process, writing and thinking, impediments to writing, facilitating writing, writing instruction, computers in writing instruction, learning with writing, and evaluating writing; emphasis on psycholinguistic and psychological fundamentals necessary for understanding current research and practice; introductory course for advanced undergraduate or graduate students.

7P:181 Introduction to Theories of Learning **3 s.h.**
Role of learning theories in psychology and education; types of theories; overview of theories, past and present, as they relate to teaching.

7P:183 Artificial Intelligence and Human Learning **3 s.h.**
Issues in the design of teaching and learning systems using the concepts of artificial intelligence; representation of domain knowledge and teaching knowledge using a LOGO environment. Prerequisite: 7W:135.

7P:193 Special Readings and Projects **arr.**
Supervised individual study. Senior standing and consent of instructor required.

7P:195 Topics in Psychological and Quantitative Foundations **arr.**
Selected topics in any area of psychological and quantitative foundations offered according to interest and demand.

7P:202 Cognitive Differential Psychology **3 s.h.**
Advanced topics in human abilities; emphasis on information processing research and theories of abilities and ability development. Prerequisites: 7P:102, 7P:143, and 7P:257; or consent of instructor.

7P:206 Advanced Child Development 3 s.h.
Theories of behavioral development; analysis of current controversies in the field; the school as a context for development. Prerequisite: 7P:106 or equivalent.

7P:207 Evaluation of Children with Learning Disabilities arr.
Same as 70:245.

7P:208 Pediatric Psychology arr.
Same as 70:246.

7P:209 Neuropsychology of Learning Seminar 3 s.h.
Same as 70:247.

7P:210 Social Psychology of Disability 3 s.h.
Advanced research seminar exploring social psychology of disability; issues in mental/physical disability from the individual and societal perspective; emphasis on clarifying research and theoretical strategies in psychology of disability. Doctoral student standing and consent of instructor required. Same as 70:250.

7P:220 Educational Research Methodology 3 s.h.
Procedures for planning, conducting, and reporting research; evaluation of current methods in educational research. Prerequisite: 7P:143.

7P:223 Pre-Practicum in Counseling Psychology 3 s.h.
Laboratory-based course; learning and performance of basic helping skills; integrating these skills with counseling theories and broader counseling strategies.

7P:225 Proseminar in Counseling Psychology 3 s.h.
Introduction to the historical, theoretical, professional, and scientific traditions associated with counseling psychology; focus on developing a research orientation to the field.

7P:231 Adult Development 3 s.h.
Theory and research on adult development; emphasis on implications for education and learning.

7P:235 Issues of Cultural Diversity 3 s.h.
Overview of issues in today's society; theoretical and practical aspects of the cultural adaptation process; implications for interventions in diverse populations.

7P:242 Selected Applications of Statistical Techniques 3 s.h.
Application and interpretation of correlation techniques, chi-square, the t- and F-tests, interval estimation, and simple cases of analysis of variance; for students planning to take only one course in statistical methods beyond 7P:143; not equivalent to 7P:243. Prerequisite: 7P:143 or equivalent.

7P:243 Intermediate Statistical Methods 4 s.h.
A foundation for more advanced applied courses; logic of statistical inference, chi-square, and other tests of statistical hypotheses, small sample error theory, interval estimates, introduction to analysis of variance, and selected nonparametric methods. Prerequisite: 7P:143 or equivalent. Same as 22S:148.

7P:244 Correlation and Regression 3 s.h.
Correlation techniques; selected bivariate procedures, multiple, partial, curvilinear correlation; multiple linear regression; sampling theory applied to regression analysis and correlation coefficients; introduction to path analysis. Prerequisite: 7P:243 or equivalent. Same as 22S:157.

7P:245 Application of Multivariate Statistical Techniques 4 s.h.
Multivariate analyses of variance, discriminant analysis, and factor analysis; use of multivariate statistical computer packages. Prerequisites: 7P:244 and 7P:246, or equivalents. Same as 22S:161.

7P:246 Design of Experiments 4 s.h.
Theory and methods in the planning and statistical analysis of experimental studies; testing of hypotheses about linear contrasts among means in single-factor and multifactor, completely randomized, and repeated measurement designs. Prerequisite: 7P:243 or equivalent. Same as 22S:159.

7P:247 Nonparametric Statistical Methods 3 s.h.
Selected nonparametric methods; one- and two-sample location tests and estimation methods, measures of association, and analyses of variance; special emphasis on relationships to classical parametric procedures. Prerequisite: 7P:243 or 22S:120 or consent of instructor. Same as 22S:163.

7P:248 Data Processing 3 s.h.
Computer data processing with special emphasis on FORTRAN language used by computer at Weeg Computing Center; use of center's statistical library; preparation of data to be submitted to computer; use of computer in effecting statistical analyses of thesis and research data. Consent of instructor required. Prerequisite: 7P:143 or equivalent.

7P:249 Quantitative Foundations of Scaling and Factor Analysis 3 s.h.
Foundations of exploratory and confirmatory factor analysis methods; least squares and maximum likelihood approaches; problems in factor extraction, rotation, and interpretation; structural equation models via LISREL; assumptions and limitations of alternative approaches. Prerequisite: 7P:252 or equivalent or consent of instructor.

7P:250 Computer Packages for Statistical Analysis 2-3 s.h.
Introduction to computer programs and systems designed to execute statistical analysis (SAS, SPSS, BMDP, and others); introductory descriptive lectures on regression techniques, analysis of variance, and multivariate techniques; practice in entering data, calling up desired programs, and interpreting computer output. Prerequisites: 7P:243 or 7P:242 or equivalent, and elementary knowledge of computer programming.

7P:252 Introduction to Multivariate Statistical Methods 3 s.h.
Selected topics in multivariate analysis, including multivariate significance tests, principal components and factor analysis, discriminant analysis, canonical correlation, and multivariate analysis of variance (MANOVA). Prerequisite: 7P:244 or consent of instructor.

7P:255 Construction and Use of Evaluation Instruments 3 s.h.
Design and construction of measures used in educational evaluation: achievement tests, attitude scales, performance measures, questionnaires; emphasis on methods of instrument development and evaluation of instrument characteristics. Prerequisite: 7P:150 or equivalent.

7P:257 Educational Measurement and Evaluation Using Standardized Instruments 3 s.h.
Evaluation and use of standardized tests and inventories in individual and group assessment; analyzing reliability, validity, normative data; interpreting measures of achievement, intelligence, aptitude, interests, attitudes, personality; current issues; for counselors, administrators, teachers, and measurement specialists. Prerequisite: 7P:143 or equivalent.

7P:258 Theory and Technique in Educational Measurement 3 s.h.
Mathematical theories underlying educational and psychological measurement; nature and use of item data, estimation of test reliability and validity, derivation of norms, scaling, and equating test batteries. Consent of instructor required. Prerequisites: 7P:243 and 7P:257, or equivalent.

7P:259 Scaling Methods 3 s.h.
Survey of unidimensional and multidimensional scaling techniques; introduction to available computer programs for scaling; applications in educational and psychological research. Prerequisite: 7P:243 or equivalent. Recommended: 7P:249.

7P:262 Item Response Theory 3 s.h.
Theoretical foundations and practical applications; mathematical models and estimation techniques; emphasis on current applications and issues in testing; computer estimation programs. Prerequisites: 7P:243 and 7P:257.

7P:265 Program Evaluation 3 s.h.
Approaches to the evaluation of educational programs; importance of program goals and unanticipated outcomes; role of cognitive and affective measures, interviews, and observational data; sources of and audiences for evaluation data. Prerequisites: 7P:255 and 7P:257, or equivalents.

7P:269 Advanced Personality 3 s.h.
Current research and research methods in the psychology of personality; emphasis on individual differences in personality that have implications for teaching and learning. Prerequisite: 7P:169 or equivalent.

7P:270 Advanced Psychology of Reading 3-4 s.h.
Theories and models of the reading process and its development; review of selected research studies from recent and current literature. Prerequisite: 7P:170 or consent of instructor.

7P:273 Reading Clinic: Diagnostic Practicum 2-3 s.h.
Supervised experience in administering diagnostic reading tests and reporting results and recommendations. Consent of instructor required.

7P:276 Learning from Text 3 s.h.
Nature of text-based learning in education and training; topics include theoretical models of learning from text, text characteristics that facilitate learning, the role of prior knowledge in learning from text, learning from text in the newer media (CRT, slide, film videotape/disk), interactions of text with adjuncts (pictures, etc.), designing texts that maximize learning, techniques for analyzing and evaluating texts, and individual differences in learning from text. Prerequisite: previous course work in learning or language or consent of instructor.

7P:281 Cognitive Theories of Learning 3 s.h.
Systematic and in-depth study of contemporary theories of learning and cognition and their educational implications.

7P:282 Cognitive Processes in School Learning 3 s.h.
Theoretical and empirical research, including reading, writing, mathematics, and specific subject matter. Prerequisites: introductory course in learning and 7P:131, or equivalent.

7P:283 Cognitive Development 3 s.h.
Information processing and neo-Piagetian theories of cognitive development and their educational implications; individual differences in cognitive development.

7P:285 Advanced Theories of Motivation 3 s.h.
Analysis of the theoretical and practical aspects of current theories in human motivation; discussion of instrument-development and assessment concerns, individual differences, intervention strategies, theory refinement and integration. Prerequisite: 7P:111 or equivalent.

7P:292 Supervised Research in Educational Psychology 1-3 s.h.
Faculty-guided research activity or seminars on identification of research problems, development of research designs and materials, and the conduct of research studies. Consent of instructor required.

7P:293 Individual Instruction in Psychological and Quantitative Foundations arr.
Consent of instructor required.

7P:305 Psychotherapy I: Dynamic and Phenomenological Approaches 3 s.h.
Survey of major psychodynamic and existential-phenomenological theories of personality; emphasis on implications for psychotherapy.

7P:310 Psychodiagnostics 3 s.h.
Comprehensive review of major psychometric instruments in areas of intelligence, interest, and normal and abnormal personality measurement; emphasis on integrating demographic, interview, and psychometric data into a coherent conceptualization of client dynamics and functioning; for Ph.D. students. Consent of instructor required.

7P:320 History and Systems of Psychology 3 s.h.
Philosophical underpinnings of psychology, early systems in psychology, and developments in the twentieth century.

7P:331 Seminar: Educational Psychology I: Current Topics arr.
Intensive investigation of a specific research topic from the educational psychology field. Consent of instructor required.

7P:332 Seminar: Educational Psychology II: Psychology of Learning arr.
Topical issues in the psychology of learning and cognition that have implications for understanding teaching and learning. Consent of instructor required.

7P:334 Seminar: Educational Psychology IV: Motivation arr.
In-depth examination of selected topics in motivation. Consent of instructor required.

7P:336 Seminar: Educational Psychology VI: Advanced Topics in Child Development arr.
In-depth examination of selected topics relating to developmental theory. Consent of instructor required.

7P:354 Seminar: Experimental Approaches in Counseling Research arr.
Application of experimental methodology to study of counseling and vocational phenomena. May be repeated. Consent of instructor required.

7P:355 Seminar: Educational Measurement and Evaluation arr.
Critical examination of current issues and problems of the

professional worker in the field of educational measurement and evaluation as reflected in the research literature and other professional communication media.

7P:356 Processes and Outcomes in Counseling and Psychotherapy 3 s.h.
Survey of advanced knowledge of the state of process and outcome research on psychotherapeutic procedures. Ph.D. candidacy in appropriate field required.

7P:365 Psychotherapy II: Cognitive and Behavioral Approaches 3 s.h.
Survey of major cognitive and behavioral theories of personality and psychotherapy.

7P:375 Topics in Educational Measurement and Statistics 1-3 s.h.
May be repeated.

7P:380 Practicum in College Teaching arr.
Supervised college teaching experience in courses related to major academic areas, in collaboration with faculty instructor teaching such courses.

7P:393 M.A. Thesis in Psychological and Quantitative Foundations arr.
Consent of instructor required.

7P:394 Supervised Research in Counseling Psychology 1-3 s.h.

7P:434 Practicum in Counseling Psychology 3 s.h.
Supervised practice in counseling services. May be repeated. Consent of instructor required. Prerequisites: 7P:223 and 7P:225, or equivalents.

7P:453 Advanced Practicum in Counseling Psychology 3 s.h.
Supervised work in counseling services. May be repeated. Consent of instructor required. Prerequisite: 7P:434 or equivalent.

7P:465 Issues and Ethics in Professional Psychology 3 s.h.
Survey of professional ethics; survey of issues in professional practice of psychology.

7P:466 Forensic Counseling Psychology 3 s.h.
Selected topics in mental health law: psychological testimony; consultation in the legal system; jury selection; simulated case presentations. Consent of instructor required.

7P:493 Ph.D. Thesis in Psychological and Quantitative Foundations arr.
Consent of instructor required.

School Psychology

7P:205 Professional Seminar: School Psychology 1-2 s.h.
Historical look at school psychology; current influences on rules; brief overview of contemporary issues. Consent of instructor required.

7P:237 Practicum in School Psychological Service arr.
Supervised practicum in psychological and educational evaluation in school settings. May be repeated. Consent of instructor required. Prerequisites: 7P:238 and 7P:251.

7P:238 Assessment of Learning Difficulties 1-3 s.h.
Same as 7U:238.

7P:251 Individual Intelligence Testing 3 s.h.
Administration of individual intelligence tests and interpretation of test results; issues in psychological testing; factors that influence performance. Consent of instructor required. Prerequisite: 7P:143 or 7P:150.

7P:263 Consultation Theory and Practice 2-3 s.h.
Same as 7C:263, 7W:263.

7P:311 Practicum in Counseling and Psychological Services for Gifted Students 1-6 s.h.
Educational, personal, and family issues for graduate students who have had course work in counseling education, counseling psychology, school psychology, educational psychology, or related fields. Consent of instructor required. Prerequisite: 7C:178 or equivalent. Same as 7C:311.

7P:337 Field Experience in School Psychology arr.
Supervised internship in psychological evaluation, consultation, and counseling in school and clinic settings. Consent of instructor required. Prerequisites: 7P:237, 7P:238, 7P:251, and 7P:352.

7P:340 Ph.D. Professional Seminar in School Psychology 1-3 s.h.
Historical look at school psychology; current influences on rules; brief overview of contemporary issues. Consent of instructor required.

7P:342 Research Project in School Psychology arr.
Identifies and provides experience in research facilities on campus; assists students in writing research questions, planning a research study, and writing a research article; for Ed.S. research project. Consent of instructor required.

7P:345 Seminar in Psychoeducational Interventions 3 s.h.
Interventions by school psychologists, counselors, and other support personnel; applications to classroom and system-wide targets.

7P:352 Seminar: Behavioral Assessment and Evaluation 3 s.h.
Same as 7U:252.

7P:366 Organization Development and Change 3 s.h.
Same as 7C:366, 7W:366.

7P:390 Supervision of School Psychology Practicum/Internship arr.
Doctoral students gain experience supervising school psychology practicum or internship students. Consent of instructor required.

7P:395 Educational Specialist Research: School Psychology arr
Research project involving design, implementation, analysis, and presentation of results in a thesis for the Ed.S. degree. Consent of instructor required.

7P:427 Supervised Professional Experience in School Psychology arr.
Job site supervision of professional services. Consent of instructor required. Prerequisite: Ed.S. degree in school psychology.

7P:437 Internship in School Psychology arr.
Supervised internship for doctoral candidates in school psychology. Consent of instructor required. Prerequisite: completion of degree course requirements.

7P:447 Post-Doctoral Experience in School Psychology arr.
Supervised practice of school psychological services delivered after completion of the Ph.D. degree. Consent of instructor required. Prerequisites: Ph.D. in school psychology and placement in a postdoctoral setting.

Instructional Design and Technology

7W:91 Audiovisual Equipment for Instruction 1 s.h.
Introduction to the operation of audiovisual equipment most frequently available to the classroom teacher; still and motion picture projectors, audio- and videotape recorders, duplicating, photocopying, dry mount press, and lettering devices.

7W:92 Introduction to Microcomputing for Teachers 1 s.h.
Introduction to the operation and applications of microcomputers in schools; evaluation and selection of application programs; applications include CAI (tutorials, drills, simulations, games, and tests) and tools (word processors, spreadsheets and database systems).

7W:103 Selection and Use of Media for Instruction 3 s.h.
Educational media and their application in the classroom; emphasis on selection and evaluation of media appropriate for given instructional objectives.

7W:105 Design and Production of Media for Instruction arr.
Techniques related to the design and production of flat pictures, transparencies, slides, filmstrips, audio- and videotapes, and other media that can be used in instruction.

7W:107 Psychological Bases of Instructional Design 3 s.h.
Issues such as effects, adjunct materials, pacing and organizational structure, graphic materials, testing and grading, presentation mode, learning styles, group size and organization; physical factors such as light and temperature. Same as 7P:107.

7W:120 Introduction to Instructional Design and Technology 3 s.h.
Overview of approaches and techniques for designing effective instruction and training programs, the professional field, problems and current trends.

7W:121 Designing and Developing Instructional Materials 3 s.h.
The design, development, and use of self-paced materials. Same as 50:161.

7W:130 Photography for Instruction 3 s.h.
Planning and production of instructional materials using black and white techniques or color slides for communication; basic skills; major project required.

7W:134 Videotape in Education 3 s.h.
Planning and production of videotaped units for instructional applications; operation of VTR equipment, lighting, sets, scripting, editing, and graphics for videotape production; selection and evaluation criteria and guidelines for diffusion; practical experience in working with professional clients.

7W:135 Survey of Computer Applications to Instruction 3 s.h.
Major characteristics and distinguishing features of problem solving, drill and practice, tutorial, simulation, computer-managed instruction, and computer-based testing.

7W:139 Beginning Computer Graphics 3 s.h.
Two- and three-dimensional line graphics; first part of course is devoted to computer programming in BASIC language, second part deals with simple two- and three-dimensional graphic concepts including scaling, rotation, translation, and perspective.

7W:145 Instructional Computing Equipment 3 s.h.
Introduction to equipment used in computer-assisted instruction and other computer applications in teaching; processors, displays, I/O devices, storage devices, and specialized peripherals reviewed; students learn to assemble, disassemble, and troubleshoot instructional computing equipment. Prerequisite: 7W:135.

7W:151 CAI Languages 3 s.h.
Introduction to programming and authoring languages for computer-based instruction; students develop materials in one or more CAI languages. Prerequisite: 7W:135.

7W:170 Documentary Film and Video in Education 3 s.h.
Analysis from artistic and political perspectives; historical and theoretical aspects of documentaries; guidelines for effective use in the classroom.

7W:180 Special Topics in Instructional Design and Technology arr.
Areas of special interest for selected groups; content varies.

7W:193 Independent Study for Undergraduates and Non-Majors arr.
Opportunity for students to investigate areas of their concern. Consent of instructor required.

7W:209 Designing Instruction for Computer Applications 3 s.h.
Application of learning theory to the design, development, and evaluation of tutorial programs; emphasis on team approaches to the development of lessons. Prerequisites: 7W:135 and programming experience.

7W:220 Advanced Instructional Design and Technology 3 s.h.
Advanced study of the instructional design process; emphasis on current theoretical views. Prerequisites: 7W:103 and 7W:120.

7W:222 Instructional Strategies 3 s.h.
Review of the literature on instructional strategies, including large- and small-group activities; PSI and case studies with emphasis on issues related to design, selection, and evaluation. Prerequisite: 7W:120 or consent of instructor.

7W:225 Computer-Managed Instruction 3 s.h.
Design and development of microcomputer software for delivery of instruction, diagnostic testing, and resource management; topics include routing, selection, and presentation of instruction, human factors, data collection and management, test construction, classroom logistics. Prerequisites: 7W:135 and programming experience.

7W:234 Interactive Video 3 s.h.
Theory, research, and design of interactive video programs; emphasis on instructional videodisc combined with computer-based education; student teams develop

programs using authoring tools and existing media. Prerequisites: 7W:135 and programming experience.

7W:235 Advanced Topics in Computer-Assisted Instruction **3 s.h.**
Analysis of current research and development activities in computer-based instruction. Prerequisites: 7W:135 and 7W:107.

7W:239 Advanced Computer Graphics **3 s.h.**
Techniques such as color and shading, hidden line removal, animation; programming ability is assumed. Prerequisite: 7W:139 or consent of instructor.

7W:245 Instructional Computer Simulations **3 s.h.**
Theory, design, and development of computer-based simulations and games; research on design characteristics and effectiveness; student teams design, develop, and evaluate simulation programs. Prerequisites: 7W:135 and programming experience.

7W:262 Facilitating Learning in Health Sciences Education **3 s.h.**
Various clinical teaching models; factors involved in the development of a comprehensive clinic evaluation system. Same as 50:262.

7W:263 Consultation Theory and Practice **2-3 s.h.**
Analysis of consultation theories and practices from the related fields of instructional design, counseling, and school psychology. Prerequisite: 7W:120. Same as 7C:263, 7P:263.

7W:269 Survey of Research in Instructional Design and Technology **arr.**
Survey of research from the behavioral sciences, communications technology, and message design as related to instruction.

7W:280 Special Topics in Health Sciences Education **arr.**
Special topics of concern to individuals in health sciences education. May be repeated.

7W:293 Independent Study: Instructional Design for Majors **arr.**
Students investigate areas of their concern. Consent of instructor required.

7W:366 Organizational Development and Change **3 s.h.**
Current topics such as program development and change or grant writing; includes theory, research, and applications. May be repeated. Same as 7C:366, 7P:366.

7W:370 Practicum in Instructional Design and Technology **arr.**
Supervised experience in an applied setting.

7W:371 Internship in Instructional Design and Technology **arr.**
Supervised administrative and other nonteaching experience in public schools, social agencies, higher education, or industry. Consent of instructor required.

7W:387 Topical Seminar in Instructional Design and Technology **arr.**
May be repeated.

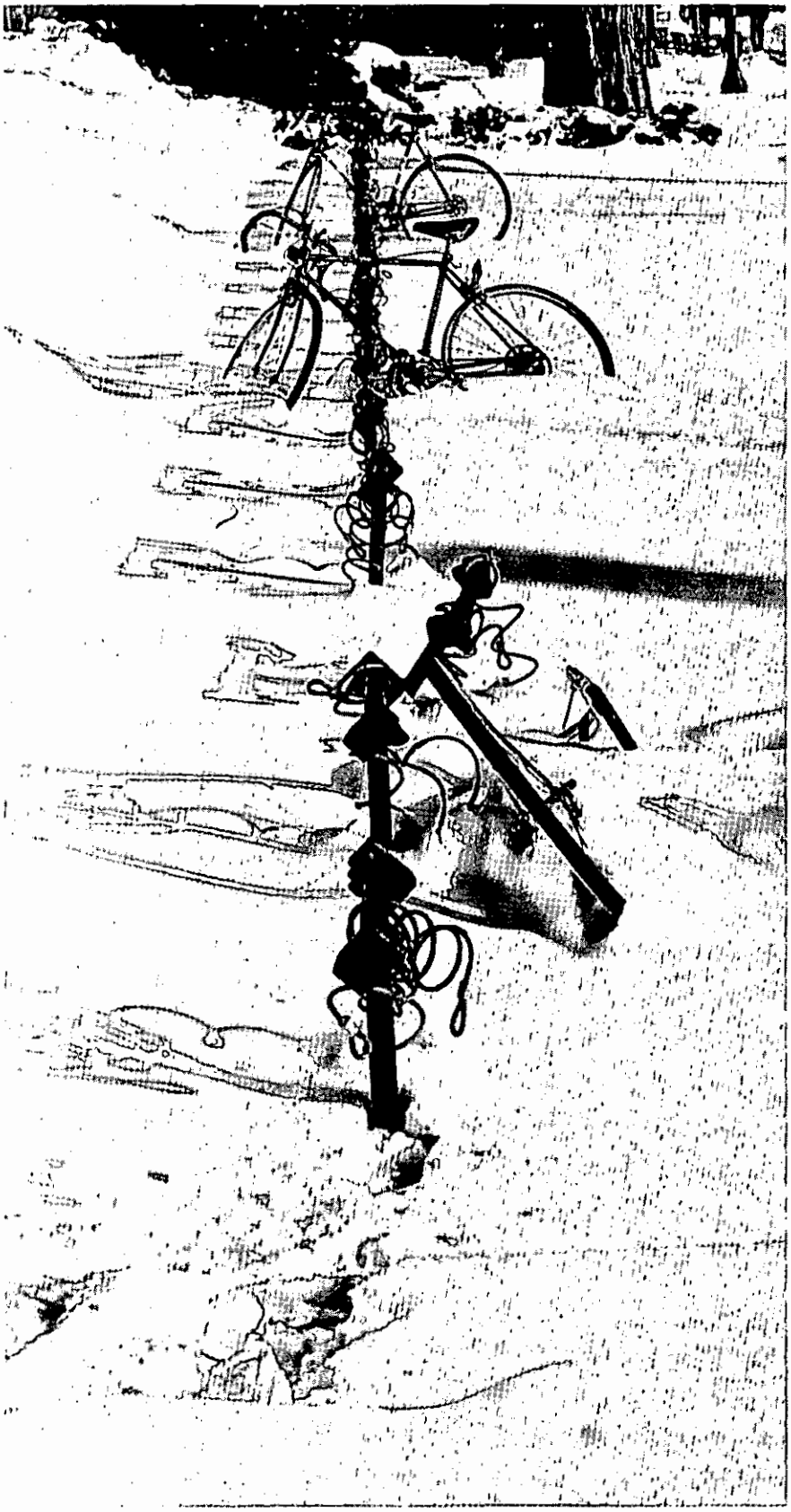
7W:391 M.A. Project in Instructional Design and Technology **arr.**
Project for the M.A.

7W:393 M.A. Thesis in Instructional Design and Technology **arr.**
Consent of instructor required.

7W:395 Ed.S. Project in Instructional Design and Technology **arr.**
Consent of instructor required.

7W:493 Ph.D. Thesis in Instructional Design and Technology **arr.**
Consent of instructor required.

Voices of Soul performance



College of Engineering

Bridge building contest during National Engineer's Week

Dean: Robert G. Hering
Associate dean: Paul D. Scholz
Assistant to the dean: Norlin W. Boyd
Director, Center for Computer-Aided Design: Edward J. Haug
Acting director, Institute of Biomedical Engineering: Kwan Rim
Director, Institute of Hydraulic Research: John F. Kennedy
Degrees offered: B.S.E., M.S., Ph.D.

Engineering is defined by the Accreditation Board for Engineering and Technology as that profession in which knowledge of the mathematical and natural sciences gained by study, experience, and practice is applied with judgment to develop ways to use, economically, the materials and forces of nature for the benefit of mankind.

In short, engineering is the application of science and mathematics to solve problems for society.

The major aim of engineering is the creation of a new process, product, material, or system. This activity demands a high degree of creativity coupled with a full understanding of engineering fundamentals, good judgment, and a practical sense of economics.

The College of Engineering prepares young men and women for one or more of the many career opportunities in the engineering profession. Such opportunities include positions in design, production, development, research, management, and consulting. Engineers are employed in industrial organizations, governmental agencies, and private practice.

The College of Engineering has two major responsibilities. The first is to provide high quality undergraduate engineering programs by maintaining contemporary engineering curricula and laboratories, as well as support services such as academic advising and engineering career counseling.

The second responsibility is to provide graduate programs in modern areas of engineering that lead to the Master of Science and Doctor of Philosophy degrees. Graduate education involves intensive research activities of a creative nature that are expected to result in original contributions to the literature at the Ph.D. level.

Programs

The College of Engineering offers programs leading to the Bachelor of Science in Engineering (B.S.E.) degree in the major fields of biomedical engineering, chemical engineering, civil engineering, electrical engineering, industrial engineering, and mechanical engineering. Programs leading to the Master of Science and Doctor of Philosophy degrees are offered in the fields of biomedical engineering, chemical and biochemical engineering, civil and environmental engineering, electrical and computer engineering, industrial engineering, and mechanical engineering.

Any of the undergraduate programs offered by the College of Engineering may be combined with a program leading to a bachelor's degree in the College of Liberal Arts, an M.B.A. degree in the College of Business Administration, and a second bachelor's degree in the College of Engineering. In addition, a combined bachelor's-master's degree program is available through each of the engineering majors and the Graduate Program in Urban and Regional Planning in the College of Liberal Arts. These combined degree programs usually may be completed in about five years. In addition, a minor in the College of Business Administration or a minor or minors in any degree-granting departmental or approved program in the College of Liberal Arts may be combined with any of the undergraduate programs offered by the College of Engineering.

The undergraduate programs in biomedical, chemical, civil, electrical, industrial, and mechanical engineering are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET).

Undergraduate Programs

Academic Recognition

Honors Program

The College of Engineering Honors Program provides special recognition for outstanding undergraduate students who demonstrate exceptional accomplishment through research, directed independent study, teaching internships, or other approved nondegree enrichment activities. Honors students may participate in a college-wide honors seminar with faculty and other honors students. Junior and senior engineering students with college and cumulative grade-point averages of 3.20 and higher are eligible to apply to the program. Successful completion of departmental requirements leads to a Bachelor of Science in Engineering with honors. A permanent notation of this achievement is recorded on the student's University academic record.

Freshman and sophomore students interested in honors are encouraged to participate in the College of Liberal Arts Honors Program, which provides access to all of the services offered by the Shambaugh House Honors Center. Students also are encouraged to join the Association of Iowa Honors Students, which sponsors a variety of social and educational activities each year. Engineering students are the second largest collegiate group in the College of Liberal Arts Honors Program.

For more information or to apply, contact the Office of the Dean, College of Engineering, 3100 Engineering Building.

Graduation With Honors

High scholastic achievement is certified in two ways; graduation with distinction based on grades only and graduation with honors based on both grades and exceptional accomplishment. To be eligible for graduation with honors, students must be recommended by their major department and approved by a selected honors committee and the director of the honors program.

Graduation With Distinction

The college awards degrees "with highest distinction" to students in the highest 2 percent of their graduating class, "with high distinction" to students in the next highest 3 percent, and "with distinction" to students in the next highest 5 percent. Ranking is based on students' grade-point averages for all college-level study undertaken up to their final registration.

To be eligible for this form of recognition, students must take their final 60 semester hours of study in residence at the college and must have completed at least 45 semester hours of study in the college before their final registration. Students in the combined engineering/liberal arts program are eligible for this recognition regardless of the college in which they complete their residency requirements.

President's List

Students who earn a 4.00 grade-point average for two consecutive semesters (excluding summer sessions) on at least 12 or more semester hours of graded work, with no I or 0 grades standing on the current or past semester's record, are recognized by inclusion on the president's list.

Dean's List

Engineering students who achieve grade-point averages of 3.50 or above during a given semester on 12 or more semester hours of graded work, with no I or O grades standing on the current or past semester's record, are recognized by inclusion on the dean's list for that semester.

Degree Requirements

The Bachelor of Science in Engineering (B.S.E.) degree requires a minimum of 128 semester hours of credit, including satisfaction of the specific requirements of the engineering program as described in the following sections. Candidates for the B.S.E. degree must be enrolled in the College of Engineering for at least the last 30 semester hours, or 45 of the last 60 semester hours, or a total of 90 semester hours. They must have a minimum grade-point average of 2.00 on all college work used to satisfy the degree requirement as well as on all work undertaken at The University of Iowa. In addition, candidates must have completed 22M:35 Engineering Calculus I and 22M:36 Engineering Calculus II, or their equivalents, with a grade of C- or better in each course.

Students who wish to be considered for graduation must file an application for degree with the Office of the Registrar before the deadline date during the session in which the degree is to be conferred.

Students who do not graduate on the date indicated in the application must file another application for a degree for the

next applicable session. Students do not need to be registered to apply for a degree.

Admission Requirements

To qualify for admission to the College of Engineering as a freshman, Iowa resident applicants must have:

Successfully completed at least four years of English/language arts; four years of mathematics, which must include at least two years of algebra, one year of geometry, one-half year of trigonometry, and one-half year beyond trigonometry; two years of a single foreign language; three years of natural science, which must include at least one year of chemistry and at least one year of physics; and at least two years of social studies;

Completed the Enhanced ACT Assessment with a composite standard score of 25 or above and a standard score of 25 or above in mathematics (or equivalent SAT scores); and

Ranked in the upper one-half of their high school graduating class.

One-half year of a high school computer programming course is highly recommended.

Nonresident freshman applicants must have completed the same high school requirements as required and recommended for resident applicants, and must have:

Completed the Enhanced ACT Assessment with a composite score of 26 or above and a mathematics score of 26 or above (or equivalent SAT scores); and

Ranked in the upper 30 percent of their graduating class.

Transfer applicants must complete the same high school course requirements as entering freshmen and must submit an official high school transcript as well as a transcript of college work undertaken at other institutions. Each transfer applicant must have:

Completed at least one semester of calculus or its equivalent; and

Maintained a cumulative grade-point average of at least 2.25.

Freshman and transfer applicants who do not meet the foreign language requirement may be admitted on a conditional basis for a maximum of four regular semesters in order to complete two semesters of an introductory, college-level foreign language. Students who do not meet the other high school course requirements may be admitted upon special review by the College of Engineering, and may be required to make up deficiencies. Courses taken at The University of Iowa to make up deficiencies do not count toward graduation.

Fulfillment of the minimum requirements for admission does not ensure admission to the College of Engineering. The college selects those applicants who appear to be best qualified for the study and practice of engineering.

Undergraduate Curriculum

The faculty of each engineering program has established a set of required and elective courses that must be satisfactorily completed as part of the requirements for a degree in that program. The established set of courses is known as the curriculum for that program. General guidelines for establishing the course requirements in each program are provided by the national accrediting body, the Accreditation Board for Engineering and Technology (ABET). The purpose of the curriculum in each program is to prepare students for the practice of engineering in that program.

Curriculum Stems

The curriculum for each program is divided into four major curriculum stems: mathematics and basic sciences; engineering sciences; engineering design; and humanities and social sciences. In addition to the four major stems, there are a few general background courses that fall outside of the stems. These courses are scheduled in the freshman year. They include Engineering I and II and Rhetoric, which is a freshman course in writing, speaking, and critical reading. The Engineering I and II courses cover a breadth of topics from engineering as a profession to computer-aided graphics.

Mathematics and Basic Sciences

The mathematics and basic sciences stem provides the foundation upon which the engineering courses in each engineering program are based. This stem includes a minimum of five courses in mathematics and two each in chemistry and physics. The faculty of each engineering program has specified at least one additional mathematics or science course beyond these minimum requirements that provides a base appropriate for that major.

Engineering Sciences

The second curriculum stem, engineering sciences, builds upon the math and science stem in order to bridge from fundamental principles to applications and creative practice. The engineering science courses use the underlying principles learned in the mathematics and basic science courses to understand and predict the behavior of idealized models of real components or systems encountered in engineering. These courses include statics, thermodynamics, and electrical circuits as well as other engineering courses relevant to each major.

Engineering Design

Engineering design, the third curriculum stem, is the process of devising a system, component, or process to meet desired needs. It is a decision-making process, often iterative, in which the basic sciences, mathematics, and engineering sciences are applied optimally to convert resources to meet a stated objective. The design process includes the establishment of objectives and criteria, synthesis, analysis, construction, testing, and evaluation. Essential to the design process is the inclusion of realistic constraints such as economic factors, safety, reliability, aesthetics, ethics, and social impact.

Because of the need to utilize a spectrum of basic and applied subject matter, which involves course work taken early in the curriculum, the design courses and activities usually begin in the junior year and end with a capstone course or activity in the senior year.

Humanities and Social Sciences

The fourth stem involves course work in the humanities and social sciences. This stem serves to engender an appreciation for and understanding of society and culture.

All of the courses in these curriculum stems are sequenced and integrated in meaningful patterns so that students better understand the interrelationships and importance of each stem.

Freshman and Sophomore Years

Approximately one-half of the course requirements in each engineering program are common to all the engineering majors. These common course requirements constitute a core program. Most of the courses in the core program are scheduled in the freshman and sophomore years, along with a few program-specific courses. Hence, students generally may postpone making a decision about which engineering major to pursue, or may change their engineering major through the freshman year with minimal loss of time or credits.

Exceptions to the common freshman year are biomedical engineering and chemical engineering, both of which require a second chemistry lecture course during the second semester of the freshman year. By careful planning, undecided engineering majors may schedule the common courses and postpone the decision about a major until as late as the end of the third semester. However, because of prerequisite sequencing, such delays may result in an extra semester or a summer session. The curriculum for each engineering program is listed in the sections devoted to each major in this section of the *Catalog*.

The following are freshman year courses that are common to all engineering curricula:

First Semester

4:13 Principles of Chemistry I	3 s.h.
10:3 Rhetoric	4 s.h.
22M:35 Engineering Calculus I	4 s.h.
57:5 Engineering I	3 s.h.
Humanities or social science elective	3 s.h.
Total	17 s.h.

Second Semester

4:16 Principles of Chemistry Lab I	2 s.h.
22M:36 Engineering Calculus II	4 s.h.

22M:40 Matrix Algebra for Engineers	2 s.h.
29:17 Introductory Physics I	4 s.h.
57:6 Engineering II	3 s.h.
Total	15 s.h.

The courses listed above are required of all students in engineering; 4:14 Principles of Chemistry II is recommended during the second semester for students who are biomedical or chemical engineering majors. Students in these majors usually postpone taking 22M:40 Matrix Algebra for Engineers until the first semester of the sophomore year. Students pursuing a major in industrial engineering should review the social science requirement specified for that major before selecting any social science courses.

The above list of courses that are common for all the engineering majors assumes that entering freshmen qualify for the advanced rhetoric class, 10:3. Students who do not meet the eligibility requirement for 10:3 are required to complete the two-course sequence 10:1-2 Rhetoric, for a total of 8 semester hours. However, only 4 semester hours may be applied toward the degree requirement for rhetoric.

Credits earned for courses below the level of the beginning courses specified in each engineering curriculum appear on a student's grade report and permanent record, but generally are not used to satisfy any electives or required courses for an engineering degree. Examples of courses in this category besides 10:1 Rhetoric include mathematics courses 22M:1-20, chemistry courses 4:5-8, and physics courses 29:4-15.

For undecided engineering majors who want to postpone selecting an engineering major beyond the freshman year, a third semester of courses common to all the majors could include the following.

Third Semester

22M:41 Differential Equations for Engineers	3 s.h.
29:18 Introductory Physics II	4 s.h.
57:7 Statics	2 s.h.
57:8 Electrical Circuits	3 s.h.
57:9 Thermodynamics I	3 s.h.
Total	15 s.h.

Students pursuing three semesters of courses common to all majors may encounter a delay in graduation because of scheduling problems for program courses that require sequencing or that are offered only once a year.

Humanities and Social Sciences Requirements

The goal of the humanities and social sciences requirements is to provide more effective preparation for professional responsibilities by integrating humanities and social sciences into the undergraduate engineering curriculum.

Students select, with their adviser's approval, a minimum of 16 semester hours of humanities and social science electives with at least 6 in the humanities and at least 6 in the social sciences. In each case, the 6 semester hours usually include a lower-level course followed by an advanced-level course from the same department. Social science courses in the industrial engineering major are specified. Students considering a major in this program should consult "Industrial Engineering" in this section of the *Catalog* for their required social sciences courses.

Courses that are primarily mathematical or scientific in nature and those that are designed specifically to develop introductory language skills or speaking, writing, artistic, or music skills are not acceptable as social science or humanities electives even though they are offered through departments listed below.

Humanities electives may be selected from any of the following departments and schools: African-American World Studies; American Studies; Art History; Classics; Asian Languages and Literature; Theatre Arts; English; History; Literature, Science, and the Arts; Music; Philosophy; Religion; Linguistics; or other departments approved by the curriculum committee of the College of Engineering.

Following an introductory-level course, students select a minimum of 3 semester hours of advanced (100-level) course work to secure sufficient depth of knowledge in an elected subject of study. This advanced course work must be in the same department as the introductory course unless prior approval has been obtained from the curriculum committee of the College of Engineering. Language courses do not satisfy any of the humanities requirements unless the courses are at or beyond the second-year level.

Social science electives may be selected from the following departments: Anthropology, Urban and Regional Planning, Economics, Geography, Political Science, Psychology, Sociology, Journalism and Mass Communication, Social Work, or other departments approved by the curriculum committee of the College of Engineering. To assure an adequate depth of knowledge in a chosen area of study and following an introductory-level course, students select a minimum of 3 semester hours of advanced (100-level) course work. This advanced course work must be in the same department as the introductory course unless prior approval has been obtained from the curriculum committee of the College of Engineering.

Combined Engineering/Liberal Arts Program

Students may earn two University of Iowa baccalaureate degrees in a combined program in the Colleges of Engineering and Liberal Arts. Successful candidates are awarded a B.S.E. (Bachelor of Science in Engineering) by the College of Engineering and a B.A. (Bachelor of Arts), B.S. (Bachelor of Science), B.F.A. (Bachelor of Fine Arts), B.G.S. (Bachelor of General Studies), or B.M. (Bachelor of Music) by the College of Liberal Arts.

Students in this combined program usually are able to meet the baccalaureate degree requirements of both colleges in about five academic years. The exact length of time necessary to complete the program is determined by the major areas of study selected in each college. Students who enter the combined degree program are assigned two faculty advisers, one in their major department in the College of Engineering and the other in their major department in the College of Liberal Arts.

To enter the combined degree program, students must be eligible for admission to the College of Engineering. Interested students should schedule an appointment with the assistant to the dean of the College of Engineering. Students must be approved for candidacy in the combined degree program by the College of Engineering and must be admitted to both the College of Engineering and the College of Liberal Arts.

Students who enter the program are required to complete the General Education Requirements and the requirements for the major in the College of Liberal Arts. Liberal arts high school course or unit requirements for admission apply to combined degree program applicants.

It is crucial that students enroll in the proper mathematics and engineering courses early in their course of study to expedite the completion of their program. The specific engineering courses taken by students varies according to the engineering major selected. Since courses in natural sciences, mathematics, humanities, and social sciences are accepted regularly for credit by both colleges, in many cases students satisfy the requirements of both colleges by taking a particular course.

To qualify for both degrees in the combined degree program, candidates must complete an overall total of 158 semester hours of credit, including at least 30 semester hours of courses offered by the College of Engineering and at least 30 semester hours of courses offered by the College of Liberal Arts.

Combined College of Engineering/M.B.A. Program

An Accelerated Professional Track (APT) Program has been initiated by the College of Business Administration for superior undergraduate students who want to begin their M.B.A. studies while finishing their engineering degree. Strategically selected course work may allow such students to complete the bachelor's degree in four years and the M.B.A. degree in the fifth year. Exceptional students with interest and competence in the applied sciences and business administration may enhance their managerial career opportunities through this combined degree program.

To qualify for the APT program, students must have completed two years of engineering study, earned a 3.50 grade-point average or better, and indicated the intent to pursue both degree programs simultaneously on a full-time basis. Students selected for admission to the program may be candidates for $1,000-per-semester fellowships ($700 for summer session) while graduate students. The graduate fellowships are provided by the College of Business Administration.

Admission to the APT program does not guarantee admission to the Graduate College. However, since the undergraduate admission requirements are very high and the undergraduate curriculum demanding, it is anticipated that admitted students will readily qualify for admission to the graduate M.B.A. program upon application.

A cooperative education internship experience with industry is arranged for admitted M.B.A. students. This professional employment experience with private industry is considered to be an integral part of the combined degree program. It generally is scheduled for the summer session after the completion of the bachelor's degree.

The M.B.A. curriculum is designed for upper-level students; no previous courses in business are required. The program consists of three components: foundation courses, integrated core courses, and elective courses. The integrated core courses and electives must be completed after students have been admitted to the Graduate College. Foundation courses, however, may be completed while students are enrolled as undergraduates. Engineering students may qualify for a waiver from certain foundation courses by proficiency exam or through equivalent course work.

Engineering students are assigned a major adviser in the College of Engineering. Upon acceptance into the APT program, advising for the M.B.A. program is provided by the operations coordinator of the College of Business Administration. Coordination of the combined degree program for APT students is provided by the assistant to the dean of the College of Engineering and the associate dean of the College of Business Administration.

Combined B.S. in Engineering/M.S. or M.A. in Planning

A program combining a bachelor's degree in engineering with a master's degree in urban and regional planning has been developed for students who want to pursue a career in planning in either the public or private sector. Planning encompasses the development of alternatives to improve the quality of life in cities and regions.

Planners devise courses of action in response to a variety of problems and opportunities and assess the likely outcome of these actions. They are involved in diverse fields such as public transit, low income housing, neighborhood preservation, environmental protection, infrastructure finance, downtown revitalization, social services, and economic development.

Students in the program may acquire a B.S. in engineering and an M.A. or M.S. in planning in a total of five or more academic years. Students should apply for the joint program either when they apply for admission to the engineering college or before they complete their sophomore year following matriculation. A letter requesting admission to this program should be submitted by the student to the College of Engineering, The University of Iowa.

As with the combined engineering/M.B.A. program, admission to this program does not guarantee admission to the Graduate College, which is required in order to complete the degree requirements in the planning program. Hence, students in this combined degree program should be aware of the admission requirements for the graduate planning program and should be prepared to meet these requirements when they apply for admission to the program (near the time when they are completing the B.S.E. degree requirements).

The curriculum is based on the philosophy that planners must develop the theoretical and analytical skills that permit them to identify issues and recommend alternate ways of resolving these issues. In addition, planners must develop the professional skills (e.g., report writing, presentations and briefings, computer literacy, team management) that allow them to function effectively in various organizational and political environments. Students become well versed in topics such as economic theory, quantitative methods, information presentation techniques, and approaches to citizen involvement.

At the heart of The University of Iowa planning program is an integrated core curriculum. Its purpose is to provide a rigorous foundation for the analysis of public and social issues. The core program is completed by engineering students in the last two years of the undergraduate program. Sectoral majors (areas of concentration) are organized around public policy problem areas. They include transportation, housing and community development, environmental quality, urban infrastructure, and economic development. Students fulfill the sectoral major requirement by completing 9 semester hours of credit in courses offered by various departments and schools of the University, including the graduate planning program and the engineering college. They complete these courses after graduating from the College of Engineering and while enrolled in the graduate program in urban and regional planning.

Each student is assigned an adviser from engineering and one from planning. During the first four years of the program, students work primarily with their engineering adviser and the assistant to the dean of the College of Engineering. For the fifth year, students confer with their graduate planning adviser.

Two Bachelor's Degrees in Engineering

Recent College of Engineering graduates and current students may earn two bachelor's degrees in engineering. The requirements for the second degree are to complete, with a minimum grade-point average of 2.00, at least 30 additional semester hours of residence course work beyond the requirements of 128 semester hours for the first degree program. The additional semester hours must include all courses required by the program selected for the second degree, including the senior-level design course sequence of the second degree program as well as any specific social science elective requirements. The technical electives selected for the second degree program must be of a variety and level that permit students to meet at least the minimal level of competence usually expected of graduates of that program.

Students must file an academic plan of study, which must be approved by the faculty of the second degree program and submitted to the office of the dean, before they may initiate course work in the second degree program. The proposed academic plan of study should include a list of the courses to be taken in the second program along with a list of the courses already completed and yet to be completed for the first engineering degree program. The approved plan must be submitted to the office of the dean and placed in the student's permanent file before the student begins course work in the second program. Any changes in the plan must be approved by the student's faculty adviser in the second program and by the department chair of that program (the college petition form may be used for this purpose) and submitted to the office of the dean for inclusion in the student's permanent file.

Minors

While fulfilling degree requirements in engineering, undergraduate students also may fulfill requirements for a minor in the College of Business Administration or a minor or minors in any degree-granting department or approved program in the College of Liberal Arts. A minor in another college may be earned by satisfying requirements established by the college offering the minor. A notation of the minor is entered on the student's permanent record.

Students must inform the registrar's office of their fulfillment of minor requirements when they apply for a degree. This assures that the minor designation is included on their transcript.

Minor in Business Administration

Requirements for a minor are two economics courses (6E:1 and 6E:2), two accounting courses (6A:1 and 6A:2), a marketing course (6M:100), a management course (6J:100), a finance course (6F:100), and a legal course (6J:47). In addition to these required courses, students usually complete a calculus course, a computer course, and a probability and statistics course.

Engineering majors satisfy the mathematics, statistics, computer science, and management requirements with courses 22M:35, 22S:39, 57:6, and 57:14. A 2.00 grade-point average in courses applicable to the minor is required. Students who want to complete a Master of Business Administration degree later should select courses that satisfy M.B.A. requirements.

Minor in Liberal Arts

Requirements for a minor are a minimum of 15 semester hours in the minor department, at least 12 of which are in advanced courses at The University of Iowa and acceptable to the department. Students should confer with the minor department to identify acceptable courses. Students must achieve a 2.00 grade-point average in the courses applicable to the minor. Courses to be counted toward the minor may not be taken pass/nonpass.

Cooperative Education Program

Cooperative education involves the integration of academic work with practical experience in an organized program. Participating students spend alternate periods in full-time academic study on campus and in full-time engineering-related employment in business, industry, or government.

Students can earn a substantial portion of college expenses during the work periods, but the success of the program depends on the work experience having significant educational value as well. This is assured by careful monitoring of the work experience provided by participating employers and by matching student interest and ability to the work situation.

The insight gained by involvement in the practical application of subject matter studied in the classroom usually results in improved motivation during the study periods, with a corresponding improvement in academic record. Another important aspect of the experience gained, although it is difficult to evaluate, is the increased awareness of the many nontechnical considerations involved in any engineering project.

The co-op phase ordinarily begins during or immediately following the sophomore year and continues until the beginning of the senior year. The total time for the degree program under this option usually is five years and includes the equivalent of at least one full year of work experience. The program is an option available to qualified students on a voluntary basis.

Undergraduate Academic Advising Center

Students who are considering engineering but want to explore various fields of study before they declare a specialized major should enroll in the College of Liberal Arts as open majors. They will be assigned an adviser from the Undergraduate Academic Advising Center. With the advisers' help, students select courses appropriate for the engineering program while they explore other fields of interest. Students meet frequently and regularly with their advisers for the intensive advising support they need as they evaluate their educational alternatives and plan their programs of study. The advisers' offices are located in Burge Hall and Dey House. For more information, contact the Undergraduate Academic Advising Center, Burge Hall or Dey House, The University of Iowa.

Academic Standards

Semester Load Limit

A normal academic load is about 16 semester hours of course work for a semester, 8 semester hours for a summer session. No student may register for more than 18 semester hours in one semester, or 9 semester hours in a summer session, without the permission of the assistant to the dean.

Classification of Students

Students in the College of Engineering are classified by the number of semester hours of credit earned applicable to a bachelor's degree in engineering, according to the following:

Freshman—fewer than 29 semester hours;
Sophomore—30 to 59 semester hours;
Junior—60 to 89 semester hours;
Senior—90 or more semester hours.

Grading System

The college uses a letter grading system with a plus or minus to designate gradations of performance between the letters. The numerical equivalents of the letter grades with the plus and minus options are as follows:

Grade (definition)	Grade points
A+	4.33
A (superior)	4.00
A–	3.67
B+	3.33
B (above average)	3.00
B–	2.67
C+	2.33
C (average)	2.00
C–	1.67
D+	1.33
D (below average)	1.00
D–	0.67
F (failing)	0

This grading system is used for all students in both undergraduate and graduate engineering courses. Grades of D- are passing grades, that is, courses completed with grades of D- or better count toward collegiate requirements. Grades of A+ have a value of 4.33 in calculating grade-point averages for a student, but the averages displayed in University records will be truncated so they do not exceed 4.00.

Academic Probation and Good Standing

Students enrolled in the College of Engineering who fail to attain the following minimum semester and cumulative grade-point averages based on all work taken at The University of Iowa are placed or continued on academic probation.

Freshman—1.80;

Sophomore—1.90;

Junior—1.95;

Senior—2.00.

Students whose semester and cumulative grade-point averages equal or exceed those appropriate to their classification are considered to be in good standing in the college.

Students are removed from, or placed on, academic probation only at the end of a semester. Students are not permitted to reregister without specific approval following two consecutive semesters on probation. Students who have not made satisfactory improvement in scholarship may be dismissed from the college; they may petition the assistant to the dean for permission to reenroll after an interval of two regular semesters.

Dropping and Adding Courses

Courses may be added with permission of the adviser and the instructor during the first three weeks of the semester or first one and one-half weeks of the summer session.

Courses may be dropped with permission of the adviser and the instructor at any time during the first ten weeks of the semester. Only under compelling circumstances may courses be dropped after the tenth week, in which case special approval must be granted by the adviser, the course instructor, and the associate dean. Under no circumstance are students permitted to drop after the beginning of the scheduled final examination period.

Undergraduates receive the mark of W for any course dropped after the third week of the semester or first one and one-half weeks of the summer session. To curtail excessive registration and dropping of the same course, students may not drop the same course with a mark of W more than

twice. Special courses that may be repeated are exempt from this rule.

Withdrawal of Registration

Students in good academic standing who withdraw their registration during the final four weeks of a regular semester, or during the final three or two weeks of a twelve- or eight-week summer session, respectively, are not permitted to enroll for the semester immediately following without specific approval from the assistant to the dean.

Students on scholastic probation who withdraw their registration at any time without good cause are considered as having been dismissed for poor scholarship.

Withdrawal cards for students enrolled in the college are signed by the assistant to the dean only upon recommendation by the student's adviser and department chair.

Pass/Nonpass Option

A maximum of two courses taken in the Colleges of Liberal Arts or Business Administration on a pass/nonpass basis may be applied toward satisfaction of the humanities and social sciences requirement. Students who want to take such courses in liberal arts or business administration pass/nonpass must meet the conditions and follow the procedures specified by those colleges. The pass/nonpass option may not be used for courses taken to satisfy the rhetoric requirement.

Students enrolled in courses taught in the College of Engineering may choose to be graded on a pass/nonpass basis under the following conditions:

The signatures of the adviser and instructor must be obtained on the proper form and the completed form must be submitted to the registrar by the student within the time period established by University policy;

The mark of P (pass) is awarded where the final course grade earned was C- or above; the mark of N (nonpass) is given for grades of D+ or below; marks of P and N are not used in computing the grade-point average and the mark of N does not count as earned hours;

No course work taken in the College of Engineering on the pass/nonpass option may be used to satisfy requirements for an engineering degree.

Second-Grade-Only Option

Students may elect to repeat a course with only the new grade being counted in their grade-point average. This option can be elected only prior to completion of a course for which the repeated course is a prerequisite. The option may be applied to no more than three courses and it may be applied only once to a given course.

Transfer students may apply the option on a prorated basis. For example, students who transfer no more than 42 semester hours of applicable engineering course work may use this option for a maximum of three courses, while students who transfer between 42 and 86 semester hours of credit may use this option for no more than two courses, and students who transfer 86 or more semester hours may use this option for only one course. Students who want to exercise this option should apply to the assistant to the dean.

Satisfactory/Fail Courses

The noncredit professional seminar courses required in each of the professional programs are offered only satisfactory/fail. No other engineering courses are offered on this basis. An F (failure) grade earned for such a class does not satisfy any portion of the professional seminar requirement.

Incomplete and No Report Grades

A mark of I (incomplete) or O (no report) that is not replaced by a final grade prior to the announced deadline during the student's next regular semester of registration is replaced by a final grade of F (failure). Students with incompletes from the spring semester are exempt from completing the course during the succeeding summer session.

Credit by Exam or by Substitution

Advanced Placement Program

Students who have pursued college-level courses in high school through the Advanced Placement Program (APP) of the College Entrance Examination Board and have achieved satisfactory scores on the comprehensive examination administered through the Advanced Placement Program are awarded college-level credit. For example, students earning scores of 3, 4, or 5 in an AB-level calculus course in the Advanced Placement Program receive 4 semester hours of credit for 22M:35, Engineering Calculus I. Likewise, students earning scores of 3, 4, or 5 in a BC-level calculus course receive 8 semester hours of credit for 22M:35-36 Engineering Calculus I-II. Credit earned through other APP courses also may be applied to other engineering course requirements as appropriate to content and level, so long as credit for those requirements has not already been earned through other exams or course enrollments. Questions about APP credits should be directed to the assistant to the dean.

CLEP Credit

Credit earned through the College-Level Examination Program (CLEP) may be applied to meet appropriate requirements in engineering. For example, up to 7 semester hours of credit earned on the social science general exam and/or on the subject exams on separate social science topics may be applied to satisfy a portion of the social science requirement. Similarly, up to 7 semester hours of credit in the general and/or separate subject exams in the humanities may be applied to satisfy a portion of the humanities requirement. However, no more than a total of 10 semester hours of CLEP credit may be applied to the total humanities and social sciences requirements for engineering.

Completion of the depth requirement in the social sciences and humanities using CLEP credit to satisfy the beginning level prerequisite can be accomplished as follows:

Social sciences: CLEP credit in the general social sciences category, followed by a 100-level course in any acceptable social science area;

Humanities: CLEP credit in literature, followed by a 100-level course in literature; CLEP credit in historical perspectives, followed by a 100-level course in history; CLEP credit in general humanities category, followed by a 100-level course in any acceptable humanities area, including literature and history.

Credit earned on other CLEP subject exams also may be applied to meet other course requirements as appropriate in content and level on a nonduplicate basis. Questions about CLEP exams and credits should be directed to the assistant to the dean.

Credit by Examination

Students who have acquired knowledge in engineering subject matter from sources other than formal course registrations may be granted the opportunity to obtain credit toward graduation by examination. For example, credit for an engineering core course may be earned by achieving a satisfactory test score on a comprehensive exam similar to a final exam for that course. Conditions and limitations of this policy are established by the faculty of the College of Engineering. Students who want to apply for such an examination should contact the assistant to the dean.

Credit by Validation

Students with course credits obtained at an unaccredited institution may request validation of the credit up to a maximum of 12 semester hours. Credit by validation may be granted after students have completed at least 24 semester hours of course work at The University of Iowa that includes appropriate courses for which the work to be validated are prerequisites. Students who want to use this option should contact the assistant to the dean during their first semester of enrollment in the College of Engineering.

Credit from Other Colleges

Course requirements in engineering may be satisfied by credits earned from courses taken in other colleges of the University or at other accredited colleges or universities. When students apply for admission to the

College of Engineering, they must submit official transcripts from each college attended along with their application for admission. After the credit has been certified by the Office of Admissions as college-level work from an accredited institution and after admission has been granted, the credit is evaluated by the assistant to the dean either prior to or during the student's first semester of enrollment in the college.

Satisfaction of engineering course requirements by transfer course work may be approved by the assistant to the dean if, on a course-by-course basis, there is a match in the content and level of the transfer courses, and the grades earned for such courses are C or higher. Students who want to satisfy the engineering social sciences and humanities requirements or The University of Iowa rhetoric requirements by transfer work should contact the assistant to the dean for details.

Students planning to attend a two- or four-year institution before transferring to the College of Engineering are well advised to discuss the planned transfer with officials at both schools before embarking on a transfer program. The College of Engineering does have recommended course lists for most Iowa community colleges and some four-year colleges. The course lists are available by contacting the assistant to the dean. Once students are enrolled in the College of Engineering, all course work they have taken at other institutions must be preapproved by the assistant to the dean if credit for it is to be applied to meet engineering degree requirements.

By policy of Iowa's State Board of Regents, a student who has earned 64 semester hours of college credit from all sources may transfer no more credit from a two-year college toward meeting the 128 semester hours required for graduation. If a student has earned more than 64 semester hours of credit from a two-year college, the credit and grades are used in computing the grade-point average and may be used to satisfy course requirements even though they may not be counted toward the total hours needed for graduation.

Course Substitutions

For students in the College of Engineering, the substitution of an alternate course for a required course requires the approval of a petition. The petition form is available in the office of the dean. The form must be completed by the student and approved by the student's adviser and by the chair of the academic department in which the student is majoring.

If the petition involves a required engineering core course, then it must also be approved by the associate dean who acts on behalf of the college curriculum committee. Substitutions for required engineering core courses should occur infrequently and only under compelling circumstances. Substitutions of courses that are required by the student's department major are governed by the faculty of that department; approval of these course substitutions is needed only from the faculty adviser and the department chair. All petitions must be forwarded to the office of the dean for inclusion in the student's permanent file.

Auditing Courses

Students in the College of Engineering may register for a course for zero credit (audit) with the permission of the course instructor and the adviser. The mark of R will be assigned to those registered for the course for zero credit where attendance and performance are satisfactory; if unsatisfactory, the mark of W will be assigned. Courses completed with a mark of R do not meet any requirements nor do they carry any credit toward graduation. Auditing may not be used as a second-grade-only option.

To register for a course on an audit basis, students must enter the course on their registration card in the usual manner, except that they should indicate zero credit hours. The instructor's authorizing signature and the adviser's signature also are required on the reverse side of the registration card. To change registration from audit to credit or from credit to audit, a drop-add form is used. These changes must be made during the first three weeks of a semester or one and one-half weeks of a summer session.

Misconduct and Complaints

Student Academic Misconduct

Regulations dealing with cases of cheating or plagiarism are delineated by a collegiate policy. In cases of cheating on an exam or quiz, the policy recommends that the instructor reduce the student's grade, including the assignment of F for the course. When a course grade has been reduced to an F, the student may not drop the course or use the second-grade-only option to eliminate the failing grade.

At the beginning of each semester, course instructors individually announce and explain their policies on acceptable levels of student-student collaboration on graded work, which includes homework assignments, and lab or design projects. When a policy is violated, a zero is assigned for the total portion of the course grade allocated to the requirement in which the violation occurs. The instructor sends a written report of any disciplinary action to the office of the dean and the report is placed in the student's file. Students are notified by the office of the dean of any disciplinary action reported and are informed of appeal procedures if they want to protest the action.

Student Complaints Concerning Faculty Actions

In cases where complaints do not involve alleged student academic misconduct, students with complaints against faculty first should attempt to resolve the issue with the faculty member. Lacking a satisfactory outcome, the student should discuss the matter with the chair of the faculty member's department.

Students who are uncomfortable dealing directly with a faculty member or a department chair may seek assistance from the faculty ombudsperson when attempting to resolve a complaint. However, grievances generally can be satisfactorily resolved most expeditiously at the faculty or chair level. If students are not satisfied with the outcome of this procedure, they should discuss their complaints with the dean of engineering.

Student Organizations and Activities

The College of Engineering student body is organized as the Associated Students of Engineering. This organization provides a mechanism for planning and carrying out activities involving the entire college, such as the student and faculty picnic, the homecoming corn monument, MECCA Week, and sponsoring of a nationally prominent speaker during National Engineers' Week. The organization also acts on collegewide matters of general student interest.

Engineering students publish their own student journal, *Hawkeye Engineer.* All positions are staffed by students, with faculty serving only in an advisory capacity.

The following technical societies are represented by University of Iowa student chapters: American Institute of Chemical Engineers, Institute of Industrial Engineers, Society of Computer Simulation, American Society of Civil Engineers, American Society of Mechanical Engineers, and Institute of Electrical and Electronics Engineers.

A student club of the Society of Automotive Engineers is open to all engineering majors, and a student society of biomedical engineers, which is formally recognized by the University, is open to biomedical engineering majors. The UI chapter of Tau Beta Pi, a national honorary society for students in all engineering fields, gives special recognition to superior students in their junior and senior years. Senior and graduate engineering students who have special ability in research are eligible for election to Sigma Xi. The work of students who are outstanding in their respective fields is recognized by Alpha Eta Mu Beta, honorary biomedical engineering society; Phi Lambda Upsilon, honorary chemistry and chemical engineering society; Omega Chi Epsilon, honorary chemical engineering society; Chi Epsilon, honorary civil engineering society; Eta Kappa Nu, honorary electrical engineering society; Alpha Pi Mu, honorary industrial engineering society; and Pi Tau Sigma, honorary mechanical engineering society.

Student organizations dedicated to providing support and assistance in the development of more equitable enrollments of minorities and women in the college are the Black Students in Engineering and the student chapter of the Society of Women Engineers. A local chapter of Theta Tau, a national professional engineering fraternity, is active in service to the college and draws its membership from students throughout the college.

Professional Registration

Registration as a professional engineer is governed by the laws of each state. The minimum requirements include graduation from an accredited engineering curriculum of at least four years, followed by at least four years of practical experience.

In Iowa the agency that controls and monitors the licensing procedure is the State of Iowa Engineering and Land Surveying Examining Board. The first step in the procedure for students enrolled in an accredited program is to pass an examination on engineering fundamentals given at the University near the time of graduation. (Graduates of unaccredited programs must complete at least one year of professional experience to be eligible to take the engineering fundamentals exam.) Following graduation and the successful completion of the engineering fundamentals exam, graduates receive an Engineer-in-Training (EIT) certificate. The final step in the procedure is to pass the advanced exam in a specialty area following a minimum of four years of approved professional experience. At this point the graduate engineer is a registered "Professional Engineer."

Graduate Programs

The general rules and regulations for the graduate programs are established by the Graduate College. However, the specific admission and degree requirements for each graduate engineering program are included in the sections devoted to the individual programs. Also included in those sections is a description of the financial aid available in each program and the principal areas of study and research.

College Facilities

Engineering Library

The Engineering Library is a center of college activity. Its collection includes 85,000 books and 650 periodicals. It is equipped with microfilm and microfiche readers, and provides study spaces for 100 library users.

Iowa Computer-Aided Engineering Network (ICAEN)

This facility provides primary support for instructional computing in the College of Engineering. ICAEN consists of approximately 100 computer engineering work stations manufactured by the Apollo division of Hewlett Packard. Each of these is a powerful computer joined with a high-resolution video display for graphics applications. The Apollos are tied together by a high-speed network, allowing all stations to share common data, programs, and peripheral devices.

The Apollos are augmented by a large number of Apple Macintosh personal computers. The Macintoshes can, at the user's command, function as stand-alone facilities, be tied to the Apollo network or Weeg Computing Center facilities, or be used to access national computer networks. A variety of printers, plotters, and other specialized devices are available through the ICAEN system.

Software supported by ICAEN includes several programming languages as well as graphics and word processing facilities. Also available are a number of contemporary software packages for computer-aided engineering, including two- and three-dimensional drafting and design, surface and solids modeling, finite element modeling and analysis, system simulation, control system analysis, and electronic design.

ICAEN facilities are used by students throughout the undergraduate and graduate engineering program and in all engineering disciplines. Several large student laboratories provide engineering students with access to ICAEN. The Howard J. Elder Laboratory for Engineering Computing, located on the fourth floor of the Engineering Building, houses 20 Apollo work stations and 40 Macintoshes, together with printers, plotters, and other related equipment. A second, functionally identical facility is located on the third floor. A third student facility, intended to support more advanced applications, is located on the first floor.

Small work station clusters for software and course development work are located in each of the six engineering departments. Remote clusters are located in the chemical engineering department in the Chemistry-Botany Building and in the Hydraulics Laboratory of the Iowa Institute of Hydraulic Research.

Computer Services

In addition to local facilities provided by ICAEN, services of the Weeg Computing Center are available to students and faculty of the college. Access to Weeg facilities is available at student computing laboratories in the college.

The college's Center for Computer-Aided Design, located in the Engineering Research Facility, has extensive computer facilities, including an Alliant FX/8 mini-supercomputer, a VAX 11-780 super-minicomputer, and advanced graphics equipment for research in computer-aided design.

The electrical and computer engineering department has two VAX 11-750 minicomputers and a number of Sun and Apollo graphics work stations for teaching and research. In addition, a number of minicomputers and microcomputers are available within the college for specialized use by students and faculty.

Career Planning and Placement Services

The Engineering Placement Office is a resource center for students and alumni seeking professional and summer employment. Services provided to graduating students include on-campus interviews, current job listings, information and assistance with resumes, cover letters, interview technique seminars, and assistance in career decision making.

Major resources available to all engineering students and alumni include a comprehensive employer library; information from employers specifically seeking to hire engineers for full-time and summer positions; current data on hiring projections and starting salaries; and placement data on recent graduates. The Engineering Placement Office, with interview rooms and a resource area, is located in Room 3121 of the Engineering Building.

Organization of the College

The College of Engineering is organized into six departments and three research units. The six departments are biomedical engineering, chemical and biochemical engineering, civil and environmental engineering, electrical and computer engineering, industrial engineering, and mechanical engineering. Each department offers undergraduate and graduate degree programs. Information about each of the degree programs follows in later sections.

The three research units are the Iowa Institute of Hydraulic Research, the Center for Computer-Aided Design, and the Iowa Institute of Biomedical Engineering. Descriptions of these units follow.

Iowa Institute of Hydraulic Research

The Iowa Institute of Hydraulic Research (IIHR) has been widely acknowledged for many years to be an international leader in numerous areas of hydraulic engineering and fluid mechanics. It was organized formally in 1931 to coordinate capabilities, facilities, and resources available at the University for research on problems in engineering hydraulics and hydrology, and

soon broadened its scope of activities to include fluid mechanics.

Active programs of basic and applied engineering research are conducted at IIHR in five modern, well-equipped laboratories with total floor space exceeding 72,000 square feet. Programs currently are being pursued in the following areas: sediment-transport mechanics; river engineering; dispersion processes; ice/artic engineering; hydraulic structures; water resources simulation; computational hydraulics and fluid mechanics; hydrology; ship hydrodynamics; boundary layers (with emphasis on thick and three-dimensional boundary layers); turbulence and turbulent shear flows; and water quality dynamics.

High-level involvement of graduate students is a hallmark of most IIHR projects. Because it is a unit of the College of Engineering, and because it is heavily involved in fluids engineering for industry and in fundamental research programs, IIHR provides unique opportunities for valuable research and engineering experience to advanced-degree students and postdoctoral trainees as part of their educational programs.

Center for Computer-Aided Design

The Center for Computer-Aided Design was founded to enhance research and development of design methods using modern computer technology. In 1987 it was designated by the National Science Foundation as an Industry/University Cooperative Research Center for Simulation and Design Optimization of Mechanical Systems.

The research program of the center is focused on mechanical system dynamic analysis and design, control system analysis, structural optimization, and dynamic computer graphics. A research facility consisting of an Alliant FX/8 mini-supercomputer, a VAX 11-780 super-minicomputer, graphics work stations, a dynamic graphics system, and other related computer equipment supports the faculty, staff, and students associated with the center.

Faculty, staff, and students participating in the center develop and distribute computer software to government and industrial participants for use in a broad spectrum of mechanical and structural design activities.

Iowa Institute of Biomedical Engineering

The Iowa Institute of Biomedical Engineering was founded primarily to maximize the economic benefits that Iowa can realize from the University's recognized strengths in the interdisciplinary areas of biomedical engineering and science. The institute accelerates the development of innovative biomedical and health care products from research and development, secures patents for newly developed products and processes, and transfers these innovations to Iowa industries.

The institute also helps Iowa industries improve productivity through effective utilization of new biomedical engineering techniques. It has developed ties with several Iowa companies and has provided research information on the construction of specialized vehicles for the handicapped and antivibration materials designed to alleviate the severity of industrial injuries caused by pneumatic tools.

Graduate and undergraduate student participation in interdisciplinary research and development is encouraged and supported by the institute. Institute faculty members engage in numerous consulting activities for industry, government, and other universities.

Course Numbering System

The title of each course offered by the College of Engineering is preceded by a two-digit prefix and a three-digit suffix separated by a colon.

The first digit of the prefix is 5, which identifies the course as one offered by the College of Engineering.

The second digit of the prefix identifies the engineering core courses or the courses offered by the departments as follows.

1—Biomedical engineering

2—Chemical and biochemical engineering

3—Civil and environmental engineering

5—Electrical and computer engineering

6—Industrial engineering

7—Engineering core

8—Mechanical engineering

The two- or three-digit suffix of a course number identifies the level and type of course. Generally the suffix numbers below 100 designate courses primarily for undergraduates, numbers 100 to 199 designate courses for undergraduates and graduates, and numbers 200 and above designate courses primarily for graduates. The table below provides a more detailed listing of course numbers and the information they convey about level and type of course.

1-6—Freshman core courses

7-19—Sophomore core courses

20-29—Junior core courses

30-89—Required courses in undergraduate programs

91-94—Undergraduate professional program seminars

95-97—Contemporary topics courses for undergraduates

98—Individual investigation courses for undergraduates

101-109—Courses for which little or no engineering, science, or mathematics background is required

110-189—Undergraduate elective or lower-level graduate course

190—Readings courses for nonmajors

191-194—Seminars for undergraduates and graduates

195-197—Contemporary topics courses for undergraduates and graduates

198—Individual investigations for graduates

199—M.S. thesis research

210-289—Upper-level graduate courses

291-294—Seminars for graduates

295-297—Contemporary topics courses for graduates

299—Ph.D. thesis research

The courses offered by each department are listed in the department's section by discipline area, starting with the lowest level course and proceeding to the highest level course.

A brief description is included for each course. The prerequisites and corequisites listed in each course description are given in terms of the courses offered at this University. Students who do not meet these requirements but who have earned credit in equivalent course work from another institution should consult the course instructor if they have questions concerning their preparation for the course. Such students must obtain the instructor's consent before registering for the course.

Engineering students may enroll in any course in the College of Engineering if they meet the course prerequisite and corequisite requirements. Undergraduate nonmajors may enroll in engineering courses only by consent of the assistant to the dean. Consent for enrollment in an engineering course is based on space available as well as on whether the students have the mathematics, science, and engineering course background considered necessary to satisfactorily undertake the course work.

Engineering Core Courses

All of the undergraduate engineering curricula, which are detailed in the following sections, build upon a core program as described in the earlier section entitled "Undergraduate Curriculum." Course descriptions follow for those courses of the core program that are offered through the College of Engineering.

Not all of the following courses are required for each engineering major. Course requirements in a specific major are given in the curriculum listing in the section for that major. None of the following courses are available to nonmajors unless special permission is obtained from the assistant to the dean.

57:000 Cooperative Education Training Assignment: Engineering 0 s.h.
For undeclared and undesignated engineering majors participating in the Cooperative Education Program; students register in this course during work assignment periods. Consent of faculty adviser required. Prerequisite: admission to the Cooperative Education Program.

57:2 Preteaching Internship: Engineering 0 s.h.
Students work with a professor teaching a course already completed by the students; students learn how to design and grade an exam, prepare for and give lectures, hold office hours for students, and develop classroom materials. Prerequisites: nomination by department chair; eligibility requirements available from associate dean of engineering.

57:5 Engineering I 3 s.h.
Concepts in engineering problem solving and representation, data analysis, technical communications, and engineering graphics. Corequisite: 22M:19.

57:6 Engineering II 3 s.h.
Engineering computations using digital computers: introduction to digital computers, high-level programming language, engineering problem solving, and numerical methods. Corequisite: 22M:35.

57:7 Statics 2 s.h.
Vector algebra, forces, couples, resultants of force-couple systems; Newton's laws, friction, equilibrium analysis of particles and finite bodies, centroid, moments of inertia, and applications. Prerequisite: 22M:35. Corequisites: 22M:36 and 29:17.

57:8 Electrical Circuits 3 s.h.
Introduction to fundamental laws of electricity and magnetism; Kirchhoff's laws and network theorems; transient response; sinusoidal steady-state analysis of simple circuits. Corequisites: 22M:36 and 29:018.

57:9 Thermodynamics I 3 s.h.
Basic elements of classical thermodynamics, including first and second laws, reversibility and irreversibility, Carnot cycle, properties of pure substances; closed simple systems and one-dimensional steady-flow open systems; engineering applications. Prerequisites: 4:13 and 29:17. Corequisite: 22M:36.

57:10 Dynamics 3 s.h.
Vector calculus, Newton's laws, 3D motion of multiparticle systems and 2D motion of rigid bodies; applications. Prerequisites: 57:7 and 22M:36.

57:12 Linear Systems Analysis 3 s.h.
Analysis of continuous and discrete time systems; system classifications; system descriptions in terms of differential or difference equations and block diagrams; frequency domain analysis using Fourier and Laplace transforms; time domain analysis using convolution. Prerequisites: 57:8 and 22M:41.

57:13 Engineering Biological Science 3 s.h.
Introduction to the fundamental mechanisms of life; basic cell functions, chemical composition of living systems, movement of molecules across cell membranes, energy and cellular metabolism, protein synthesis and cell development, transfer of genetic information; biological control systems—ionic basis of nerve cell conduction and electrical excitation, muscle contraction mechanisms; brief introduction to various organ systems; emphasis on analytical description and study. Prerequisites: 4:13, 4:16, 22M:36, and 29:17.

57:14 Engineering Economy 3 s.h.
Basic concepts of engineering economy: time value of money, cash flow equivalence, depreciation, inflation and tax considerations; main analysis techniques—present worth, uniform annual cost, rate of return, benefit/cost ratio, replacement analysis and break-even analysis. Prerequisite: 22M:36.

57:15 Materials Science 3 s.h.
Foundation course; relationship between structure and properties of materials at atomic, micro, and macro levels. Prerequisite: 4:13. Corequisite: 22M:35.

57:17 Computers in Engineering 3 s.h.
Introduction to digital systems and control using microprocessor-based computers; computer organization, machine language, addressing formats, data types, assembly language, assemblers, cross development systems, serial and parallel I/O; system control using polling and interrupts; lab arranged. Sophomore standing required. Prerequisite: 57:6.

57:18 Principles of Electronic Instrumentation 4 s.h.
Principles of operation of diodes and field-effect and bipolar transistors; bias and small-signal design and analysis techniques; FETs as switches and amplifiers; operational amplifier circuits; I.C. fabrication technology; signal conditioning and data conversion; laboratory included. Prerequisite: 57:8.

57:19 Mechanics of Deformable Bodies 3 s.h.
Elementary theory of deformable bodies, stress, strain; application to beams, columns, shafts, and pressure vessels; axial, transverse, bending, torsion, combined and buckling loads. Prerequisite: 57:7. Corequisite: 22M:41.

57:20 Mechanics of Fluids and Transfer Processes 4 s.h.
Laws governing fluid flow and transport processes; hydrostatics; transfer of mass momentum and energy; laminar and turbulent flow and boundary layers; engineering applications, including measurement of fluid and flow properties. Prerequisites: 22M:42, 57:9, and 57:10.

57:21 Principles of Design I 3 s.h.
Two- to three-week projects involving identification, modeling, and analysis of design problems using optimization principles, methodology, and computer-aided design. Junior standing required. Prerequisites: 22M:40 and 57:7.

57:22 Principles of Design II 3 s.h.
Probabilistic and statistical aspects of engineering design; topics include probabilistic models, distribution fitting, discrete time simulation, project management, component and system reliability; emphasis on model construction, design of simulation experiments, applications in engineering design, and technical report writing. Prerequisites: 57:21 and 22S:39.

BIOMEDICAL ENGINEERING

Chair: Vijay K. Goel
Professors: Richard A. Brand, Thomas D. Brown, Krishnan B. Chandran, Charles R. Clark, Steve M. Collins, Vijay K. Goel, Roderic S. Lakes, Y. King Liu, Joon B. Park, Kwan Rim
Associate professors: Won W. Choi, James N. Weinstein
Assistant professors: Edwin L. Dove, Glenn A. Myers, Maria Siebes
Undergraduate degree offered: B.S.E. in Biomedical Engineering
Graduate degrees offered: M.S., Ph.D. in Biomedical Engineering

The past two decades have seen a tremendous growth of technological activity in biology and medicine. As engineers have increasingly become involved with projects in the life and health sciences, there has been greater need for them to become more familiar with the fields of biology and medicine. Recognition of this need has led to the emergence of a new interdisciplinary engineering activity designed to bridge the gap between the life sciences and engineering—the biomedical engineering profession.

Students who complete this program may pursue career opportunities in industry (the design and development of biomedical instrumentation, diagnostic aids, life support systems, prosthetic and orthotic devices, man-machine systems), in government (Veterans Affairs, National Institute of Health, Environmental Protection Agency, Food and Drug Administration), or they may elect to continue their formal education in the engineering, medical, or legal professions.

Several engineering college faculty members have joint appointments in the College of Medicine. Both biomedical engineering undergraduates and graduate engineering students participate actively with college faculty members and their colleagues in the life and health sciences on projects of mutual interest.

Undergraduate Program

The curriculum outlined below is built on the foundation provided by the College of Engineering core curriculum and has been developed to prepare students for the challenges and opportunities associated with careers in the biomedical engineering profession. The program has been carefully designed to enable students to satisfy the entrance requirements of the Graduate College and, with the selection of a three-course sequence in organic chemistry in the elective courses, the College of Medicine.

Curriculum

*The humanities and social science electives must be selected to satisfy the humanities and social science requirements of the College of Engineering.

Freshman Year

First Semester

4:13 Principles of Chemistry I	3 s.h.
10:3 Rhetoric (or 10:1-2)	4 s.h.
22M:35 Engineering Calculus I	4 s.h.
57:5 Engineering I	3 s.h.
*Humanities or social science elective	3 s.h.
Total	17 s.h.

Second Semester

4:14 Principles of Chemistry II	3 s.h.
4:16 Principles of Chemistry Lab I	2 s.h.
22M:36 Engineering Calculus II	4 s.h.
29:17 Introductory Physics I	4 s.h.
57:6 Engineering II	3 s.h.
Total	16 s.h.

Sophomore Year

First Semester

22M:40 Matrix Algebra for Engineers	2 s.h.
22M:41 Differential Equations for Engineers	3 s.h.
29:18 Introductory Physics II	4 s.h.
37:3 Principles of Animal Biology	5 s.h.
57:7 Statics	2 s.h.
Total	16 s.h.

Second Semester

22M:42 Vector Calculus for Engineers	3 s.h.
57:8 Electrical Circuits	3 s.h.
57:9 Thermodynamics I	3 s.h.
57:10 Dynamics	3 s.h.
72:154 Biomedical Engineering Physiology	4 s.h.
Total	16 s.h.

Junior Year

First Semester

57:17 Computers in Engineering	3 s.h.
57:18 Principles of Electronic Instrumentation	4 s.h.
51:40 Biological Systems Analysis I	3 s.h.
Engineering science core elective (see "Engineering Science Core Electives," below)	3 s.h.
*Humanities or social science elective	3 s.h.
51:91 Professional Seminar: Biomedical Engineering	0 s.h.
Total	16 s.h.

Second Semester

22S:39 Probability and Statistics for the Engineering and Physical Sciences	3 s.h.
Engineering science elective (see below)	3 s.h.
57:21 Principles of Design I	3 s.h.
51:70 Biomaterials I	4 s.h.
51:80 Biomedical Measurements I	3 s.h.
51:91 Professional Seminar: Biomedical Engineering	0 s.h.
Total	16 s.h.

Senior Year

First Semester

51:85 Biomedical Engineering Systems Design	3 s.h.
Biomedical engineering design elective (see "Biomedical Engineering Electives," below)	3 s.h.
Biomedical engineering science elective (see below)	3 s.h.
Biomedical engineering elective (see below)	3 s.h.
*Humanities or social science elective	4 s.h.
51:91 Professional Seminar: Biomedical Engineering	0 s.h.
Total	16 s.h.

Second Semester

51:86 Biomedical Engineering Design Project	4 s.h.
Biomedical engineering electives (see below)	5 s.h.
*Humanities or social science electives	6 s.h.
51:91 Professional Seminar: Biomedical Engineering	0 s.h.
Total	15 s.h.

Engineering Science Core Electives

Students select one of the following courses:

57:12 Linear Systems Analysis	3 s.h.
57:15 Materials Science	3 s.h.
57:19 Mechanics of Deformable Bodies	3 s.h.
57:20 Mechanics of Fluids and Transfer Processes	4 s.h.

Engineering Science Electives

Students select one of the following courses:

57:12 Linear Systems Analysis	3 s.h.
57:13 Engineering Biological Science	3 s.h.
57:15 Materials Science	3 s.h.
57:19 Mechanics of Deformable Bodies	3 s.h.
57:20 Mechanics of Fluids and Transfer Processes	4 s.h.

A 100-level, 51-prefix course or other engineering science course approved by the advisor.

Biomedical Engineering Electives

A total of 14 semester hours must be chosen with at least one course (3 semester hours) from the biomedical engineering design electives and one 51-prefix course (3 semester hours) from the biomedical engineering science electives. The lists are as follows.

Biomedical Engineering Design Electives

55:84 Principles of Electrical Engineering Design I	3 s.h.
57:22 Principles of Design II	3 s.h.

or other equivalent design courses

Biomedical Engineering Science Electives

51:140 Biological Systems Analysis II	3 s.h.
51:145 Biomedical Computer Systems	3 s.h.
51:150 Biomechanics	3 s.h.
51:155 Cardiovascular Biomechanics	3 s.h.
51:160 Biotransport Processes	3 s.h.
51:172 Polymers as Biomaterials	3 s.h.
51:173 Metals as Biomaterials	3 s.h.
51:174 Ceramics and Glasses as Biomaterials	3 s.h.
51:177 Composite Materials	3 s.h.
51:180 Biomedical Measurements II	3 s.h.

Other Acceptable Biomedical Engineering Electives

51:151 Intermediate Mechanics of Deformable Bodies	3 s.h.
53:133 Finite Element Techniques in Engineering I	3 s.h.
55:32 Introduction to Digital Design	3 s.h.
55:33 Introduction to Software Design	3 s.h.
55:42 Signals and Systems	3 s.h.
55:148 Digital Image Processing	3 s.h.
55:164 Computer-Based Control Systems	3 s.h.
58:40 Thermodynamics II	3 s.h.
58:45 Heat Transfer	3 s.h.
58:145 Intermediate Heat Transfer	3 s.h.
58:160 Intermediate Mechanics of Fluids	3 s.h.

Organic Chemistry I
Organic Chemistry II
Organic Chemistry Lab
Genetics and other biological science courses
Other science, engineering, and design courses approved by the adviser

Biomedical Engineering Subtracks

Biomedical engineering majors are encouraged to pursue one of the following three subtrack curricula.

Biomechanics/Biofluids

Fifth Semester

57:19 Mechanics of Deformable Bodies	3 s.h.

or

57:20 Mechanics of Fluids and Transfer Processes	4 s.h.

Seventh Semester

57:22 Principles of Design II, or equivalent	3 s.h.
51:150 Biomechanics	3 s.h.
51:151 Intermediate Mechanics of Deformable Bodies	3 s.h.

or

58:160 Intermediate Mechanics of Fluids	3 s.h.

Eighth Semester

Two courses chosen from:

51:155 Cardiovascular Biomechanics	3 s.h.
51:160 Biotransport Processes	3 s.h.
51:177 Composite Materials	3 s.h.
53:133 Finite Element Techniques in Engineering I	3 s.h.

Biomaterials

Fifth Semester

57:19 Mechanics of Deformable Bodies	3 s.h.

Seventh Semester

57:22 Principles of Design II, or equivalent	3 s.h.
51:150 Biomechanics	3 s.h.

Eighth Semester

Two courses chosen from:

51:155 Cardiovascular Biomechanics	3 s.h.
51:160 Biotransport Processes	3 s.h.
51:172 Polymers as Biomaterials	3 s.h.
51:173 Metals as Biomaterials	3 s.h.
51:174 Ceramics and Glasses as Biomaterials	3 s.h.
51:177 Composite Materials	3 s.h.

Bioelectrical

Fifth Semester

57:12 Linear Systems Analysis	3 s.h.

Seventh Semester

55:32 Introduction to Digital Design	3 s.h.
55:42 Signals and Systems	3 s.h.
51:145 Biomedical Computer Systems	3 s.h.

Eighth Semester

Two courses chosen from:

51:140 Biological Systems Analysis II	3 s.h.
51:180 Biomedical Measurements II	3 s.h.
55:33 Introduction to Software Design	3 s.h.
55:84 Principles of Electrical Engineering Design I	3 s.h.
55:148 Digital Image Processing	3 s.h.
55:164 Computer-Based Control Systems	3 s.h.

Graduate Programs

The goal of graduate study at both the M.S. and Ph.D. levels is to educate students in the disciplines of biomedical engineering more deeply and broadly than is possible at the B.S. level. The goal is to enable students to use contemporary methods at an advanced level during a professional career in engineering design, development, and research.

Each student's course of study is based on individual background and career objectives, and sound academic practice. Department faculty members have teaching and research expertise in areas related to biomechanics, cardiovascular and fluid biomechanics, biomaterials, bioinstrumentation, biosystems, and other allied fields.

An individual program for each student may be developed from courses offered by the biomedical engineering department and other departments, especially mechanical engineering, electrical engineering, physiology, mathematics, and biology. M.S. students who want a more general program may combine emphases, while those who want some specialization in any particular field may accommodate these preferences through the combination of departmental courses and appropriate electives from other departments of the College of Engineering and the University.

Ph.D. programs may center on any one of the previously described areas through the choice of appropriate course work and research topic.

Master of Science

The M.S. degree in biomedical engineering requires a minimum of 30 semester hours of course work and research. Students may choose either a thesis or nonthesis program; the latter must include at least 6 semester hours of 200-level courses. Students who choose the thesis program may count between 6 and 9 semester hours of credit for thesis research and writing toward satisfying the 30-semester-hour limit. Either degree may be a terminal degree or an intermediate step toward a Ph.D. degree.

A tentative plan of study for each student is determined through consultation with an adviser. An M.S. committee of at least three graduate faculty members, including at least two on the biomedical engineering faculty, is appointed by the dean of the Graduate College. The student's plan of study is reviewed by the committee before the student has completed 18 semester hours of course work. The plan of study is then submitted for review to the department chair.

To earn the M.S. degree, students are required to attain a minimum grade-point average of 3.00 on a minimum of 30 semester hours of graduate work and successfully complete the final examination administered by their committee.

The requirements for the M.S. degree may be completed within a calendar year. However, students with assistantship duties and/or other constraints may need up to two calendar years to complete the degree.

Candidates for either of the M.S. degrees must have satisfactorily completed the following courses or their equivalents as undergraduates or graduates.

58:113 Mathematical Methods in Engineering	3 s.h.
51:130 Biomedical Engineering Labs	2 s.h.
72:154 Biomedical Engineering Physiology	4 s.h.

Two biomedical engineering courses chosen from any two of the bioelectrical, biomaterials, and biomechanics areas (the acceptable course(s) in each area are listed below).

51:141 Graduate Biological Systems Analysis	3 s.h.
or	
51:145 Biomedical Computer Systems	3 s.h.
51:150 Biomechanics	3 s.h.
or	
51:155 Cardiovascular Biomechanics	3 s.h.
51:171 Intermediate Biomaterials	3 s.h.

And additional 15 semester hours or more as approved by the student's adviser

The student's plan of study should provide for as much advanced work as aptitude and previous preparation permit.

Biomedical Engineering Project Traineeship

Under the nonthesis M.S. degree program, the biomedical engineering department offers a small number of biomedical engineering project traineeships to selected incoming graduate students who are interested in acquiring practical engineering project experience.

First Semester

58:113 Mathematical Methods in Engineering or equivalent	3 s.h.
51:130 Biomedical Engineering Labs	2 s.h.
51:286 Advanced Biomedical Engineering Project I	arr.
Design elective	3 s.h.
Technical elective	4 s.h.
Total	15 s.h.

Second Semester

58:115 Finite Element Techniques in Engineering I or equivalent	3 s.h.
51:287 Advanced Biomedical Engineering Project II	arr.
Design elective	3 s.h.
Technical elective	3 s.h.
Total	15 s.h.

Each trainee receives a $500-per-month stipend for project work (ten hours per week).

Doctor of Philosophy

The doctoral program, including acceptable transfer credits, requires a minimum of 72 semester hours of graduate work. Of these 72 hours, at least 60 semester hours must be in formal course work taken after the B.S. degree is awarded, and at least 12 semester hours must be in research and thesis credits. For students entering with an M.S. degree, at least 36 semester hours of formal course work must be completed past the M.S. degree, and at least 12 semester hours must be research and thesis credits. Based on research progress, examination results, or other measures, the student's graduate committee may require additional formal course work in order to strengthen areas of perceived weakness.

Admission to the Ph.D. program is conditional until students successfully complete a qualifying examination, which is administered by the biomedical engineering faculty. The decision on whether the student's performance on this examination is adequate for admission to the Ph.D. program is made by the biomedical engineering faculty.

Admission to Ph.D. candidacy requires a minimum grade-point average of 3.25 on all graduate work done at The University of Iowa. Upon completion of the course work specified in the plan of study, with the grade-point average stipulated above, and upon the adviser's recommendation, students are admitted to the comprehensive examination by their committee.

Having satisfactorily completed these examinations, students usually have only to complete and defend their dissertation at the final examination. Requirements for the Ph.D. degree generally can be completed in about three years beyond the master's degree.

Admissions and Financial Assistance

Students who have earned a baccalaureate or postbaccalaureate degree in an engineering curriculum or a curriculum in the mathematical or physical sciences, with a minimum grade-point average of 3.00 and an acceptable score on the Graduate Record Examination (GRE) General Test (combined verbal and quantitative score of 1250) are eligible to be considered for admission to the Master of Science degree study in biomedical engineering. Students may, under exceptional circumstances, be

considered for conditional admission with a lower grade-point average and GRE General Test scores. Students on conditional status must achieve regular status within 8 semester hours of initial registration by attaining a grade-point average at The University of Iowa of at least 3.00 and regular acceptance by the department faculty. Students who do not meet these requirements are subject to dismissal.

Reference letters, research interests, previous graduate study grade-point average, and other factors also may be considered in making admission decisions.

Students qualified for graduate study are encouraged to apply for fellowships and assistantships. Direct inquiries should be made to the departmental chair.

Special Facilities and Laboratories

Required Course Laboratories

There are two laboratories associated with two required undergraduate courses: Biomaterials I and Biomedical Measurements I.

The Biomaterials Laboratory is equipped for testing mechanical and thermal properties of biomaterials and thin sectioning of hard tissues and prostheses for histology. This laboratory also is used for 51:172 Polymers as Biomaterials, 51:173 Metals as Biomaterials, and 51:174 Ceramics and Glasses as Biomaterials.

The Biomedical Measurements Laboratory is equipped for measuring biomedical variables of clinical and physiological interest and for designing electronic instrumentation in biomedical engineering. This laboratory also is used for 51:180 Biomedical Measurements II.

Research Facilities and Laboratories

Applied Mechanics Laboratory

The Applied Mechanics Laboratory is equipped to study the biomechanics of small bone specimens under complex dynamic loading conditions.

Biomaterials Laboratory

The Biomaterials Laboratory is equipped to test mechanical thermal properties of biomaterials and thin sectioning of hard tissues and prostheses for histology.

Hemodynamics Laboratory

The Hemodynamics Laboratory is equipped to study cardiovascular fluid dynamics, particularly flow past valve prostheses and flow in the human aorta. In addition, the laboratory has an image-processing system based on the VAX computer with a Gould/DeAnza IP8400 image processor with video camera digitizer.

Biomechanics Laboratories I and II

The biomechanics laboratories are equipped to study the biomechanics of head and neck trauma, lumbar spine kinetics, and the effect of vibration on the spine.

Biomedical Image Processing and Computing Laboratory

This laboratory has an image-processing system used to digitize anatomical slides, photographs, X-rays, and CAT scan images.

Biosystems Laboratory

The Biosystems Laboratory is equipped to conduct physiological experiments on the cardiovascular and respiratory systems.

Courses

Special

51:000 Cooperative Education Training Assignment: Biomedical Engineering **0 s.h.**
Biomedical engineering students participating in the Cooperative Education Program register for this course during work assignment periods; registration provides a record of participation in the program on the student's permanent record. Consent of faculty adviser required. Prerequisite: admission to the Cooperative Education Program.

51:40 Biological Systems Analysis I **3 s.h.**
Application of principles of control theory to analysis of biological systems; development of computer simulation techniques to study dynamic response of physiological systems. Offered fall semesters. Prerequisite: 72:154.

51:70 Biomaterials I **4 s.h.**
Properties, biocompatibility characteristics, and performance requirements of materials for implants. Offered spring semesters. Corequisite: 72:154.

51:80 Biomedical Measurements I **3 s.h.**
Concepts of analog and digital circuit design, with emphasis on circuits for biomedical applications using operational amplifiers, active filter, data acquisition, and conversion and interface to microcomputers; patient safety; clinical circuits; laboratory project. Offered spring semesters. Prerequisite: 57:18. Corequisite: 72:154.

51:85 Biomedical Engineering Systems Design **3 s.h.**
Design of system elements; prosthesis; materials; case study of biomechanical system examples, computer-aided design methods, design of subsystems, and product reliability. Offered fall semesters. Corequisites: 51:70 and 51:180.

51:86 Biomedical Engineering Design Project **4 s.h.**
Creative design projects, usually involving actual current problems in biomedical engineering; projects are interdisciplinary, including both engineering and health science faculty cooperation. Offered spring semesters. Prerequisites: 51:85 and senior standing.

51:91 Professional Seminar: Biomedical Engineering **0 s.h.**
Professional aspects of biomedical engineering presented through lectures and discussions by guest speakers, field trips, films, and panel discussions. May be repeated. Prerequisite: junior standing.

51:98 Individual Investigations: Biomedical Engineering **arr.**
Individual projects for biomedical engineering undergraduate students, such as laboratory study, engineering design projects, analysis and simulation of an engineering system, computer software development, and research. Consent of instructor required.

51:130 Biomedical Engineering Labs **2 s.h.**
Introduction to the research labs associated with individual faculty members of the Department of Biomedical Engineering; laboratory experience in cardiovascular and respiratory control, hemodynamics, biomaterials, holography, biomechanics, and vibration. Prerequisite: graduate standing. Corequisite: 72:154.

51:148 Holographic Methods **3 s.h.**
Concepts of diffraction and wavefront reconstruction; in-line and off-axis holograms; methods for producing white-light viewable holograms, including Benton, open-aperture, and Denisyuk holograms; applications of holography in experimental deformation analysis of solids, fluid flow visualization, display and image processing. Prerequisite: 29:18 or 29:130 or 29:117 or equivalent.

Biomaterials

51:150 Biomechanics **3 s.h.**
Principles of solid mechanics, applied to the analytical and experimental investigation of biological systems, with special emphasis on applications in kinesiology of the human musculoskeletal system. Prerequisites: 57:10 and 57:19. Corequisite: 72:154.

51:171 Intermediate Biomaterials **3 s.h.**
Property-structure relationship of biological and implant materials and their interactions in in vivo condition. Prerequisite: 51:70.

51:172 Polymers as Biomaterials **3 s.h.**
Polymers used to manufacture implants and other devices; their structure/property relationships and their in vivo and in vitro performance. Prerequisite: 51:70.

51:173 Metals as Biomaterials **3 s.h.**
Property-structure relationship of metals used to fabricate implant materials; their interactions in in vivo condition.

51:174 Ceramics and Glasses as Biomaterials **3 s.h.**
Property-structure relationship of ceramics and glasses used to fabricate implant materials; their interactions in in vivo condition.

51:177 Composite Materials **3 s.h.**
Principles of the mechanics of solid multiphase systems; applications in lightweight structures, ultrastrong materials, and materials for the replacement of human tissues; composites with fibrous, lamellar, particulate, and cellular structures. Prerequisite: 51:151. Same as 58:170.

Biomechanics/Biofluids

51:151 Intermediate Mechanics of Deformable Bodies **3 s.h.**
Application of equilibrium analysis, strain-displacement relations, and constitutive relationships to practical structural systems and elementary plane elasticity problems. Offered fall semesters. Prerequisite: 57:19. Same as 53:140, 58:150.

51:153 Biomechanics of Orthopaedic Devices **3 s.h.**
Functional anatomy and pathomechanics of the appendicular musculoskeletal system; contemporary total hip and knee designs; endoprosthesis fixation techniques; shoulder, elbow, wrist, and finger reconstructive implants; biomechanics of fracture healing; fracture stabilization implants; external fixators. Corequisite: 51:151.

51:155 Cardiovascular Biomechanics **3 s.h.**
Anatomy and physiology of the human circulatory system, pressure-flow relationship in arteries, elastic properties of the arterial wall, pulsatile flow dynamics, flow dynamics past valve prostheses, flow through capillaries, force-velocity studies of heart muscle, force-deformation analysis of left ventricle, application of imaging techniques on left ventricular dynamics. Prerequisites: 57:19, 57:20, and 72:154.

51:160 Biotransport Processes **3 s.h.**
Application of momentum, heat, and mass transfer principle to biological systems, with emphasis on human beings; fluid mechanics of time-dependent flows in the circulatory system, heat exchange between a biological system and its environment, mass transfer in membranes. Prerequisites: 57:20 and 72:154.

51:250 Advanced Biomechanics **3 s.h.**
Anatomy of the human musculoskeletal system, biomechanical basis of joint degeneration, and its evaluation techniques; mechanical properties of hard and soft tissues, kinematics, and kinetics of human joints, including those for locomotion; experimental determination of joint forces, spinal biomechanics, design, and analysis of artificial joints. Prerequisite: 51:150.

51:251 Advanced Biofluid Mechanics **3 s.h.**
Anatomy and physiology of the human circulatory system; pressure-flow relationship in arteries; theoretical models and experimental studies of pulsatile flow development in arteries; wave propagation in arteries; microcirculation; peristaltic pumping; design and analysis of artificial implant devices. Prerequisite: 58:160.

51:252 Advanced Cardiac Mechanics 3 s.h.
Anatomy and physiology of the human heart; cardiac muscle mechanics; imaging techniques for cardiac structures; three-dimensional reconstruction of the human left ventricle; modeling of the heart as a chamber; finite element analysis of the left ventricle; experimental techniques in cardiology. Prerequisite: 51:155.

51:253 Clinical Biomechanics of Spine 3 s.h.
Anatomy of the spine (human musculoskeletal) system; biomechanical basis of joint degeneration and its evaluation techniques; mechanical properties of spinal ligaments, kinematics and kinetics of the spine, mathematical models of spine, scoliosis, braces for spinal stabilization, surgical procedures for internal fixation. Prerequisite: 51:150.

51:257 Theory of Viscoelasticity 3 s.h.
Linear theory of viscoelasticity; non-aging materials; Bolzman superposition principle, linear functionals; thermodynamic foundations; time-temperature superposition principle; boundary and initial value problem. Prerequisite: 51:151. Same as 53:247, 58:257.

Bioelectrical

51:140 Biological Systems Analysis II 3 s.h.
Application of modern control and systems analysis to the study of biological systems; identification and simulation techniques utilizing linear and nonlinear, and deterministic and stochastic models; selected aspects of the cardiorespiratory system are used as examples and problems. Prerequisite: 51:40.

51:141 Graduate Biological Systems Analysis 3 s.h.
Application of principles of system control theory to analysis of biological systems; development of computer-simulation techniques to study dynamic response of physiological systems. Prerequisite: graduate standing. Corequisite: 72:154.

51:145 Biomedical Computer Systems 3 s.h.
Data acquisition and experimental control in assembly language and a high-level language (FORTRAN, Pascal, or C) on microcomputers; digital signal processing techniques for analysis of data: FFT, auto- and cross-correlation, coherent averaging, FIR and IIR filtering. Prerequisites: 57:17 and 51:40. Corequisite: 51:80.

51:180 Biomedical Measurements II 3 s.h.
Signals and noise, types of measurements, measurement errors; application of biomedical tranducers to measure temperature, flow, force, strain; image processing; computer applications. Prerequisite: 51:80.

51:181 Graduate Biomedical Measurements I 3 s.h.
Design, development, and utilization of contemporary electronic instrumentation for measuring biomedical variables of clinical and research interest. Prerequisites: graduate standing and a basic electronics course. Corequisite: 72:154.

51:240 Advanced Biological Systems Analysis 3 s.h.
Analysis techniques from biocontrol (identification, estimation), signal processing (time series analysis, matched filters, adaptive estimation), and information theory applied to the cardiovascular and oculomotor systems. Prerequisite: 51:140 or consent of instructor.

51:245 Digital Processing of Biomedical Signals 3 s.h.
Techniques for analysis of systems and signals, with examples of biomedical problems; system representation, spectral analysis, model-based spectral analysis, random signals techniques, numerical method, FIR and IIR digital filters; systems with noise. Prerequisites: 51:140 and 51:145, or consent of instructor.

Graduate Seminars, Advanced Topics, Research

51:190 Readings in Biomedical Engineering arr.
For graduate students with nonengineering majors who want credit in undergraduate biomedical engineering courses. May be repeated. Graduate standing in a discipline other than engineering required.

51:191 Seminar in Biomedical Engineering 0 s.h.
Presentation of recent advances in biomedical engineering. Graduate standing required.

51:195 Contemporary Topics in Biomedical Engineering arr.
New topics in biomedical engineering not covered in other courses; topics, frequency, and coverage determined by student/faculty interest. Senior or graduate standing required.

51:198 Individual Investigations: Biomedical Engineering arr.
Individual projects for biomedical engineering graduate students, such as laboratory study, engineering design project, analysis and simulation of an engineering system, computer software development, and research. Graduate standing and consent of adviser required.

51:199 Research: Biomedical Engineering, M.S. Thesis arr.
Experimental and/or analytical investigation of an approved topic for partial fulfillment of the requirements for the Master of Science degree with thesis in biomedical engineering. Graduate standing and consent of adviser required.

51:286 Advanced Biomedical Engineering Project I arr.
Industrial or developmental biomedical engineering projects carried out by M.S. degree students in groups. Offered fall semesters. Graduate standing and consent of instructor required.

51:287 Advanced Biomedical Engineering Project II arr.
Continuation of 51:286. Offered spring semesters.

51:295 Advanced Topics in Biomedical Engineering arr.
Current literature in biomedical engineering; review of recent developments. Consent of instructor required.

51:299 Research: Biomedical Engineering, Ph.D. Dissertation arr.
Experimental and/or analytical investigation of an approved topic for partial fulfillment of the requirements for the Doctor of Philosophy degree with thesis in biomedical engineering. Consent of adviser required.

CHEMICAL AND BIOCHEMICAL ENGINEERING

Chair: Gregory R. Carmichael
Professors: J. Keith Beddow, Gregory R. Carmichael
Professors emeriti: Karl Kammermeyer, James O. Osburn, Arthur F. Vetter
Associate professors: Ravindra Datta, David G. Rethwisch
Assistant professors: Jonathan S. Dordick, David W. Luerkens, David W. Murhammer, Victor G.J. Rodgers
Adjunct assistant professor: Audrey Butler
Undergraduate degree offered: B.S.E. in Chemical Engineering
Graduate degrees offered: M.S., Ph.D. in Chemical and Biochemical Engineering

Chemical and biochemical engineering is the art and science of engineering applied to industrial processes in which raw materials are changed or separated into useful products. Chemical and biochemical operate the manufacturing facilities efficiently, safely, and economically.

Chemical engineers are involved in addressing today's energy crisis, finding renewable raw materials to replace the dwindling natural resources, and working for pollution control. They are employed by basic industries such as chemicals, petroleum, specialty chemicals, coal, and solvents as well as consumer-oriented industries such as plastics, food, fertilizers, pharmaceuticals, cosmetics, paints, and synthetic fibers.

Increasing numbers of chemical engineers are employed by microelectronics manufacturing companies and biochemical industries. They engage in research, process and product development, process and plant design, actual production operation, and sales. Many experienced engineers become managers or administrators.

Undergraduate Program

The Bachelor of Science in engineering degree is designed to meet modern technological requirements. Extensive preparation in chemistry courses brings chemical engineers to a comparable level in this subject as chemistry majors. A sequence of mathematics courses together with the common engineering core courses provides a strong foundation.

During the junior and senior years, the emphasis is on chemical engineering courses such as momentum transport, mass transfer operations, thermodynamics, unit operations laboratory, process dynamics and control, and process design. Experience in instrumentation, analysis, and design is obtained through an integrated laboratory program in the chemical engineering department. Routine use is made of computer-based data analysis, simulation, and design. An undergraduate computer cluster is available for student use in the unit operations laboratory. Also included in the curriculum are elective courses in the humanities and social sciences.

Chemical engineering at Iowa gives students a chance to obtain a broad education that is at the leading edge of technology. It emphasizes fundamental concepts, problem solving, laboratory techniques, and the communication skills needed to keep pace in today's and tomorrow's technical world. Students are encouraged to gain research experience by working in individual laboratories.

Curriculum

*The humanities and social science electives must be selected to satisfy the humanities and social science requirements of the College of Engineering.

Freshman Year

First Semester

10:3 Rhetoric	4 s.h.
4:13 Principles of Chemistry I	3 s.h.
22M:35 Engineering Calculus I	4 s.h.
57:5 Engineering I	3 s.h.
*Humanities or social science elective	3 s.h.
Total	17 s.h.

Second Semester

29:17 Introductory Physics I	4 s.h.
4:14 Principles of Chemistry II	3 s.h.
4:16 Principles of Chemistry Lab I	2 s.h.
22M:36 Engineering Calculus II	4 s.h.
57:6 Engineering II	3 s.h.
Total	16 s.h.

Sophomore Year

First Semester

4:121 Organic Chemistry I	3 s.h.
22M:40 Matrix Algebra for Engineers	2 s.h.
22M:41 Differential Equations for Engineers	3 s.h.
29:18 Introductory Physics II	4 s.h.
57:7 Statics	2 s.h.
*Humanities or social science elective	3 s.h.
Total	17 s.h.

Second Semester

4:122 Organic Chemistry II (or science elective)	3 s.h.
4:141 Organic Chemistry Laboratory	3 s.h.
22M:72 Elementary Numerical Analysis	3 s.h.
52:41 Process Calculations	3 s.h.
57:8 Electrical Circuits	3 s.h.
Total	15 s.h.

Junior Year

First Semester

4:131 Physical Chemistry I	3 s.h.
52:42 Momentum Transport	3 s.h.
52:43 Chemical Engineering Thermodynamics	3 s.h.
57:15 Materials Science	3 s.h.
57:13 Engineering Biological Science	3 s.h.
52:91 Professional Seminar: Chemical Engineering	0 s.h.
Total	15 s.h.

Second Semester

4:132 Physical Chemistry II (or science elective)	3 s.h.
4:135 Physical Chemistry Laboratory	2 s.h.
22S:39 Probability and Statistics for the Engineering and Physical Sciences	3 s.h.
52:44 Mass Transfer Operations	3 s.h.
52:46 Heat Transport	2 s.h.
52:91 Professional Seminar: Chemical Engineering	0 s.h.
57:21 Principles of Design I	3 s.h.
Total	16 s.h.

Senior Year

First Semester

52:45 Chemical Reaction Kinetics	3 s.h.
52:85 Process Dynamics and Control in Design	3 s.h.
52:47 Unit Operations Laboratory I	2 s.h.
57:14 Engineering Economy	3 s.h.
*Humanities or social science elective	3 s.h.
Technical elective	3 s.h.
52:91 Professional Seminar: Chemical Engineering	0 s.h.
Total	17 s.h.

Second Semester

52:48 Unit Operations Laboratory II	2 s.h.
52:86 Chemical Engineering Process Design	3 s.h.
Technical elective	3 s.h.
*Humanities and social sciences electives	7 s.h.
52:91 Professional Seminar: Chemical Engineering	0 s.h.
Technical elective	3 s.h.
Total	15 s.h.

Graduate Programs

The Department of Chemical and Biochemical Engineering offers curricula leading to the Master of Science and Doctor of Philosophy degrees. Through course work and research, students gain an understanding of the principles of engineering science and then apply those principles to contemporary problems such as energy, environment, biotechnology, and materials. The emphasis is on research since most opportunities for graduates are in research and development. A thesis is required for each degree.

All candidates in advanced degree programs are required to assist faculty members in teaching and research as part of the graduate training.

Research

Current research strengths of the Department of Chemical and Biochemical Engineering are in the areas of catalyst design, reactor design, global and regional environmental research, separation and bioseparation processes, biochemical engineering and applied biocatalysis, and particulate material processing sciences.

Catalysis and Reactor Design

Within the general field of kinetics, catalysis, and reaction engineering, research is being conducted in the areas of heterogeneous, homogeneous, and supported molten-salt catalysis; gas-solid reactions; modeling and analysis of heterogeneous reactors; and design of novel reactor-separators. Catalytic routes are being developed for fuels and chemicals from renewable resources.

Global and Regional Environmental Research

Contamination of the environment in which we live and work is a major problem facing today's engineers. The Department of Chemical and Biochemical Engineering has had an active research program in the environmental areas of atmospheric air pollution, indoor air pollution, and hazardous waste. Particular emphasis is placed on the chemistry and physics of local, regional, and global air pollution problems. Research in support of this activity includes high-speed computing and detailed sensitivity analysis. This is an interdisciplinary area involving environmental engineering and the Center for Global and Regional Environmental Research.

Separation and Bioseparations Processes

Research at The University of Iowa is devoted to better understanding and development of new techniques in the areas of separation and bioseparation processes. In particular, researchers are investigating a novel technique in ultrafiltration and microfiltration called transmembrane pressure pulsing. In this process, high frequency oscillating pressure across the membrane enhances the various fluxes through the membrane. Another new device is being investigated for preparative continuous electrophoresis. Electrokinetic dispersion, photoresponsive membranes for gas separation, and enzymatic reactor-separators are also being investigated.

Biochemical Engineering and Applied Biocatalysis

Biochemical engineering involves the industrial application of enzymes, microorganisms, cells, and tissues for production of chemicals, pharmaceuticals, and other materials of commercial value. The department is active in developing novel techniques in biocatalytic processing, including enzymes in organic solvents, enzyme-based biosensors, and biologically based membrane separators. The department is also engaged in the scale-up of animal cell cultures (insect and mammalian) for the production of recombinant proteins and monoclonal antibodies. The integration of biotechnology with traditional chemical engineering has led to an interdisciplinary area involving other engineering departments and the Departments of Chemistry, Botany, Biochemistry, and Microbiology and the College of Pharmacy.

Particulate Material Processing Sciences

Theoretical and experimental studies in morphological analysis of particulate materials are being conducted. Morphological analysis is concerned with the measurement of particle size, shape, texture, chemical properties, and physical properties. These methods are applied to particle formation processes and studies of particle and bulk behavior. Examples include wear debris analysis, crystallization and precipitation (formation processes), and dust explosions and contamination of particles (particle behavior).

Master of Science

A thesis and a minimum of 30 semester hours of graduate credit are required, including at least 24 semester hours completed in residence at The University of Iowa. Work completed in the Saturday and Evening Class Program as residence credit may not exceed 8 semester hours, but 6 semester hours may be completed in residence at another recognized graduate college or through the Guided

Correspondence Study Program at The University of Iowa.

The minimum course work requirement is 24 semester hours (about eight courses), and the remainder of the 30 semester hours is devoted to research. To be eligible for the M.S. degree, students are expected to maintain a minimum grade-point average of 3.00. M.S. degree candidates must defend their thesis at the final oral examination. Although it is possible to obtain an M.S. degree in one year, many students spend three or four semesters to complete the requirements.

Doctor of Philosophy

The Ph.D. degree is granted primarily on the basis of achievement rather than on the accumulation of semester hours of credit. However, candidates usually are expected to have completed three academic years of residence, or two years if they already hold a recognized master's degree. In any case, degree candidates are required to have completed at least 72 semester hours of graduate credit.

Ph.D. candidates are expected to maintain a minimum grade-point average of 3.50.

All doctoral students are required to pass a qualifying examination and a written and oral comprehensive examination prior to candidacy for the degree. The Ph.D. comprehensive examination may be a special design project or, at the discretion of the examining committee, may consist of a written examination covering graduate work. These examinations are arranged by members of the examining committee. The examinations may be repeated at the discretion of the committee. The rules for the comprehensive examination are published in the manual of the Graduate College. There is no foreign language requirement. A final examination, which is a defense of the thesis, completes the doctoral program.

Admission

Full admission to graduate study is granted to students who have a B.S. degree in chemical engineering with satisfactory grades from a recognized American college or university. Graduates of foreign universities also are accepted, depending on evaluation of their records. Admission to the graduate program usually requires a grade-point average of 3.00. Conditional admission to the M.S. program may be granted to students who have not fulfilled the above requirements, with approval from the chair of the chemical and biochemical engineering department.

Applicants should take the verbal, quantitative, and advanced parts of the Graduate Record Examination (GRE) General Test; scores should be submitted with the application.

Graduate courses in chemical and biochemical engineering are designed for students who have an undergraduate background in chemical engineering. However, exceptional students from other areas also may apply for admission to the M.S. or even the Ph.D. program in chemical and biochemical engineering. Such students need to take certain undergraduate courses as background so that they can perform in the graduate courses with minimum difficulty. Since these undergraduate courses are taken as make-up courses, most do not carry credit toward a graduate degree.

Financial Aid

A number of fellowships, assistantships, and scholarships are available to graduate students who qualify. These are awarded on a competitive basis.

Special Facilities and Laboratories

Undergraduate Instruction

Engineering Core

Materials Science Laboratory

This laboratory is equipped with optical microscopes and facilities for metallographic preparation, including a darkroom. Mechanical tensile testing instruments and hardness testing machines also are available. Heat treatment and sintering furnaces are available in a nearby laboratory. Teaching aids include metallography specimen kits, dislocation in LiF kits, and crystallography packages.

Required Course Laboratories

Unit Operations Laboratory

This is primarily an instructional laboratory for senior undergraduate students. It involves experimentation in transport phenomena, heat transfer, fluid flow, chemical engineering unit operations, and reaction kinetics and catalysis. The laboratory includes pilot plant equipment, such as a distillation column interfaced with a microprocessor, wiped film evaporator, shell-and-tube heat exchanger, jacketed kettle, packed column for gas absorption, plate-and-frame filter press, and agitated extractor. Other equipment includes stirred-tank reactors, packed-bed reactor, gas chromatograph, and a variety of instrumentation for measuring flow, pressure, temperature, and weight. Equipment in emerging areas of chemical engineering has recently been added, including a fully instrumented microbial fermentor, membrane separator, and polymer extruder. A small shop also is available to students for use under a technician's supervision.

Process Control Laboratory

The process control laboratory is a modern, computer-based instructional laboratory for seniors. It is integral to the senior process control course. The laboratory consists of computer control of a shell-and-tube heat exchanger, a stirred-tank reactor, and a three-tank flow process. Additional laboratories include instruction in the use of analog controllers.

The computer control laboratory is set up to provide an ensemble of learning experiences with the same equipment, so that analogies and better insight into the control process can be obtained. Topics include determination of the gain and time constants for single capacitance systems; determination of gain, time constant, and damping factor of second-order processes; determination of the open-loop and closed-loop response to step and ramp changes in input for single capacitance and multicapacitance processes; approximations of multicapacitance systems as first-order and second-order processes with dead-time through experimental evaluation; analysis of instrumentation characteristics and transfer functions; tuning and optimization of feedback control parameters (P, PI, and PID); system indentification through frequency response methods; determination of system stability; and development of feed-forward control schemes.

The laboratory is set up so that the experimental arrangements are simple enough in design to be easily understood yet complicated enough to give students an appreciation for system characteristics inherent in industrial processes (i.e., large time lags, error in parameter estimation).

Graduate Facilities and Laboratories

To support and develop research activities, the department offers a wide variety of facilities. A summary of the major research equipment within and available to the department is listed below.

Computer Facilities

The departmental computer facilities contain a variety of graphics terminals, printers, and microcomputers. The terminals connect to the University's Weeg Computing Center, which makes available these computers: IBM 3033, Prime 850, four Prime 750's, four HP2000's, and a Vax 11/780. They also provide access to the college's Computer-Aided Engineering Laboratory.

The department also is connected to the Iowa Computer-Aided Engineering Network, which includes Apollo work stations augmented with Apple Macintosh personal computers. In addition, the department has access to the University's central research facility in high-speed vector computation. This facility has Encore Multimax and Alliant FX-8 mini-supercomputers and provides nodes for external links for access to supercomputers.

Catalysis and Reaction Engineering Facilities

A variety of equipment is available for the study of catalysis. Techniques currently available include chemisorption and physisorption (BET), microbalance, mass

spectrometer system, mercury porosimetry, gas chromatography, fourier transform infrared spectroscopy (FTIR), X-ray diffraction, scanning electron microscopy (SEM), transmission electron microscopy (CTEM), a variety of reactor systems including a Berty reactor, a membrane reactor-separator for homogeneous catalysis, a slurry reactor, and catalyst preparation facilities including radio frequency (RF) sputtering, metal cluster nucleation source, and glove box system. Also available are central research facilities such as the Iowa Laser Facility, with a variety of state-of-the-art laser instrumentation, and the High-Field Nuclear Magnetic Resonance Facility.

Materials Characterization Facilities

Facilities include a uniquely equipped laboratory for the characterization of powders and particulates. The laboratory contains a variety of size and morphology instruments including a Quantachrome BET Surface Area Analyzer; a Stereo-Pycometer for measuring powder density; an Autoscan Mercury Porosimeter; a Micromeritics Sedigraph; a TSI, El-Zone, and Coulter Counter particle counters and sizers; and a Shape Analysis for particle image analysis for morphological and texture determination.

Other facilities include sampling devices, devices for characterizing bulk properties; various mixers, grinders, and sizing equipment; optical microscopes; sintering furnaces; an abrasion tester; mounting and polishing equipment; a lab scale fluidized bed; and an extruder for the production of particles of specific size and shape. The laboratory also contains a fully controlled two-liter explosion chamber for the determination of dust explosibility and a Bruel and Kjaer fast fourier acoustic analyzer. In addition, there is access to the University's Electron Probe Microanalysis and Electron Microscopy facilities.

There also are facilities available to study microelectronic materials. These include techniques and clean facilities to characterize crystal growth, wafer preparation, and etching techniques. In addition, the Hybrid Microelectronics Laboratory housed in the electrical and computer engineering department provides capabilities in small-scale microelectronic chip and substrate manufacturing, including vacuum deposition, a Cooke sputtering machine, photolithography apparatus, a belt furnace, air abraider, and a variety of electronic testing instruments.

Separation and Bioseparation Processes

Equipment available for the study of separation processes includes a large-scale, continuous-rotating, annular bed electrophoresis column; a packed-bed electrophoresis column; a Waters Delta Prep 3000 HPLC system; an Amicon DC 30 ultrafiltration system; a small-scale hollow fiber and spiral wound membrane pilot system; membrane permeability measurement apparatus; immobilized reactor-separators; and facilities for the fabrication of membranes. The laboratory is supported by additional gas and liquid chromatographs, a Perkin-Elmer UV-Vis scanning spectrophotometer, a computerized data acquisition system, and other analytical equipment. The department also has pilot plant equipment for the study of filtration, distillation, extraction, and other equilibrium stage processes. Future plans include installation of capillary electrophoresis, reverse osmosis, and pilot-scale low-pressure liquid chromatography systems.

Biochemical Engineering and Applied Biocatalysis

Facilities in the Biochemical Engineering Laboratory include a three-liter agitated bioreactor and a fifteen-liter airlift fully controlled bioreactor, gas and liquid chromatographs, UV-Vis spectrophotometers, centrifuges, carbon dioxide incubators, Class II-A safety cabinets, microscopes, Coulter particle counter, rotary shaker, autoclave, 2-D gel electrophoresis equipment, and laboratory computers.

Through collaborative research agreements, graduate students also have access to the electron microscopy facility, hybridoma/tissue culture facility, flow cytometry and cell sorting facility, mass spectrometry facility, recombinant DNA research facility, protein structure facility, and the large-scale fermentation facility.

Laboratory of Applied Biocatalysis

The Laboratory of Applied Biocatalysis is designed for the study of enzymes, immobilized whole cells, and biopolymer and bioseparation technology. The laboratory occupies 1800 square feet in the Chemistry-Botany Building and contains two analytical HPLC's (equipped with a photodiode array and refractive index detection), a preparative HPLC, two gas chromatographs (with FID and ECD detection), a scintillation counter for radioactivity measurements, an optical polarimeter, two rotary evaporators, a low-pressure Pharmacia liquid chromatography device with fraction collector, two UV-Vis scanning spectrophotometers, a spectrofluorophotometer, four temperature-controlled orbital shakers, several large-scale enzyme reactors, a Karl-Fisher water titrator, an ultrafiltration system for protein separations, a water-purification system, two analytical digital balances and a top-loading digital balance, a cold box, refrigerator, and freezer, a Sorvall centrifuge and two microfuges, and a freeze dryer.

Courses

Special

52:000 Cooperative Education Training Assignment: Chemical Engineering **0 s.h.**
Chemical engineering students participating in the Cooperative Education Program register for this course during work assignment period; registration provides a record of participation in the program on the student's permanent record. Admission to the Cooperative Education Program required. Consent of the co-op faculty adviser required.

52:41 Process Calculations **3 s.h.**
Solutions of industrial problems using material and energy balances; stoichiometric and nonstoichiometric chemical reactions, change of state, solutions, and mixing problems. Prerequisite: 22M:36.

52:43 Chemical Engineering Thermodynamics **3 s.h.**
Applications of thermodynamic principles to chemical and physical processes; prediction of material properties; phase equilibria and chemical equilibrium applied to mixtures and reacting systems. Prerequisites: 4:131 and 52:41.

52:47 Unit Operations Laboratory I **2 s.h.**
Laboratory investigations of transport phenomena and chemical engineering unit operations; design of experiments, operating procedures, data collection techniques, report writing, computer usage, and laboratory safety. Prerequisites: 52:44, 52:42, 52:46, and 52:43.

52:48 Unit Operations Laboratory II **2 s.h.**
Open-ended laboratory studies of transport phenomena, chemical engineering unit operations, process control, and reaction kinetics; emphasis on project design, construction, development, and evaluation. Prerequisites: 52:47 and 52:45.

52:91 Professional Seminar: Chemical Engineering **0 s.h.**
Professional aspects of chemical engineering presented through lectures and discussions by guest speakers, field trips, films, and panel discussions. May be repeated. Junior standing required.

52:98 Individual Investigations: Chemical Engineering **arr.**
Individual projects for chemical engineering undergraduate students, such as laboratory study, engineering design project, analysis and simulation of an engineering system, computer software development, and research. Consent of faculty adviser required.

52:115 Engineering Project Management **3 s.h.**
Project management, entrepreneurship, and inventiveness; for upper-level and graduate students. Senior standing in engineering required.

52:117 Advanced Thermodynamics **3 s.h.**
Fundamental principles of thermodynamics as applied to phase equilibrium; properties of fluids, first and second law, phase equilibrium, variable composition systems, behavior of real fluids, mathematical techniques for solution thermodynamics. Prerequisite: 52:43 or graduate standing.

52:118 Advanced Mathematical Methods for Chemical Engineers **3 s.h.**
Analytical solutions to ordinary and partial differential equations, asymptotic approximations to partial differential equations, perturbation theory, asymptotic expansion of integrals, boundary layer theory, summation of series as applied to chemical engineering problems. Prerequisite: 52:42 or 52:44 or graduate standing.

Biochemical Engineering

52:180 Biochemical Engineering **3 s.h.**
Introduction to biochemical engineering design of bioreactor/fermentors, sterilization procedures, process scale-up, medium development, enzyme kinetics, transport phenomena, and mathematical modeling. Prerequisite: 57:13 or consent of instructor.

52:181 Bioseparations **3 s.h.**
Introduction to separation/purification techniques in biochemical engineering; filtration, centrifugation, chromatography, extraction, electrophoresis, crystallization, and cell disruption for intracellular product recovery. Prerequisite: 52:180 or consent of instructor.

52:182 Biochemical Engineering Laboratory **3 s.h.**
Biological techniques, emphasis on their application to biochemical engineering, laboratory investigations of bacterial and animal cell cultures, electrophoresis, chromatography, enzymology, recombinant DNA, MAb synthesis and applications, sterile techniques. Prerequisites: 52:180 and 52:181, or consent of instructor.

52:247 Applied Enzymology **3 s.h.**
Application of enzymes in biotechnology; enzymes as commercial biocatalysts; immobilized enzyme technology; isolation, purification, stabilization of enzymes; enzyme

reactors; mechanisms of commercially important enzymes; enzymatic catalysis in unusual environments; catalytic antibodies and ribozymes. Prerequisite: 52:180.

52:280 Engineering Aspects of Animal Cell Culture 3 s.h.
Applications of animal cell culture (insect and mammalian) in biochemical engineering, emphasis on recombinant protein synthesis; special considerations of animal cell cultures (e.g., sensitivity to hydrodynamic stress), scale-up of attachment-dependent and attachment-independent cell cultures, medium development, hybridoma cultures, protein processing in animal cells. Consent of instructor required. Prerequisite: 52:180.

52:281 Advanced Topics in Biochemical Engineering 3 s.h.
Advanced biochemical engineering, multienzyme reactors, advanced enzyme kinetics, biosensors, cell culture, mixture culture, advances in biotechnology; students complete semester-long project design that includes law, economics, cost estimation, and project management. Consent of instructor required. Prerequisite: 52:181.

Mass Transfer

52:44 Mass Transfer Operations 3 s.h.
Fundamental principles of diffusional processes; diffusion, distillation, extraction, absorption, leaching, humidification, adsorption, drying, ion exchange, and less conventional separations. Prerequisites: 4:131 and 52:41.

52:240 Diffusional Mass Transfer 3 s.h.
Fundamentals of binary and multicomponent diffusional mass transfer processes including mass transfer in laminar and turbulent flows. Prerequisite: 52:144.

52:243 Topics in Separation Processes 3 s.h.
Theory and application of separation processes; topics include membrane separations, electrophoresis, and chromatography. May be repeated.

Environmental Engineering

52:147 Modeling Analysis 3 s.h.
Numerical analysis applied to transport phenomena, chemical kinetics, reaction design; emphasis on model formulation and numerical solution; ordinary and partial differential equations. Prerequisite: 52:144. Same as 53:160.

52:152 Environmental Chemistry 3 s.h.
Principles of general, physical, and organic chemistry applied in water and air systems; emphasis on qualitative and quantitative understanding of chemical kinetics and equilibrium; acid-base reactions, complex formation, precipitation, dissolution, oxidation-reduction reactions, organic nomenclature. Prerequisite: 4:13. Same as 53:152.

52:159 Air Pollution Control Technology 3 s.h.
Sources, environmental and health impacts, regulations and modeling of air pollution; processes and alternative strategies for control; global climate considerations. Prerequisite: 53:150 or consent of instructor. Same as 53:159.

52:163 Atmospheric Chemistry and Physics 3 s.h.
Principal chemical and physical processes affecting atmospheric trace gas and pollutant cycles; emphasis on atmospheric photochemistry, aerosol science, major sources, removal processes. Consent of instructor required. Same as 53:161.

Reaction Engineering

52:45 Chemical Reaction Kinetics 3 s.h.
Application of chemical reaction rates to design of chemical rectors: batch reactors, mixed flow reactors, plug flow reactors; reversible and irreversible single reactions; parallel, series, and mixed reactions; temperature and pressure effects on reactor design; catalysis. Prerequisites: 52:43 and 52:44.

52:145 Intermediate Chemical Reaction Kinetics 3 s.h.
Advanced topics in applied chemical reaction kinetics, including chemical reaction stoichiometry and equilibrium, heterogeneous catalysis, diffusion and reaction in porous catalysts, multiplicity of equilibrium, linear and nonlinear reaction dynamics, noncatalytic fluid-solid and gas-liquid reactions. Prerequisite: 52:45.

52:148 Catalysis 3 s.h.
Selected topics in heterogeneous catalysis; emphasizes applications of collision theory, transition state theory, and acid-base concepts to catalysis and the use of surface analysis techniques. Prerequisite: 4:131.

52:149 Polymer Science and Technology 3 s.h.
Introduction to the uses and properties of industrially important polymeric materials; polymer chemistry, polymer structure, characterization, polymer processing. Prerequisite: 4:122.

52:245 Advanced Chemical Reactor Design 3 s.h.
Advanced design of reactors for heterogeneous solid-catalyzed reactions; heterogeneous catalysis and characterization, kinetics of catalytic reactions, transport and reaction in porous catalysts, catalyst deactivation, selectivity and stability in catalysts pellets, fixed-bed catalytic reactors, reactor optimization. Prerequisite: 52:45.

Transport Phenomena

52:42 Momentum Transport 3 s.h.
Introduction to transport phenomena, differential and integral momentum balances, fluid rheology, and applications of equations in motion; specific topics include boundary layer flow, laminar and turbulent flow in ducts, packed beds, fluidized beds, flow measurement, pumps, agitation, and filtration; design correlations and dimensional analysis. Prerequisite: 52:41.

52:46 Heat Transport 2 s.h.
Mechanisms of heat transfer, one-dimensional steady and unsteady state conduction, forced convection, natural convection, boiling and condensation, radiation heat transfer, and design of heat exchanges and evaporators. Prerequisite: 52:42.

52:142 Physicochemical Hydrodynamics 3 s.h.
Interaction of fluid flow with physical, chemical, and biochemical processes and forces; emphasis on common fundamentals of seemingly diverse phenomena; equations of change, Taylor dispersion, packed-bed dispersion, chromatography, gel chromatography, sedimentation, membrane transport, electroosmosis, electrophoresis, sedimentation and streaming potential, field-flow fractionation, colloidal stability. Prerequisites: 52:42 and 52:46, or graduate standing.

52:144 Transport Phenomena I 3 s.h.
Unified treatment of momentum, mass, energy transport in chemical engineering problems; use of vector and tensor notations in expressing equations of continuity, motion, and energy. Prerequisites: 52:42 and 52:44, or consent of instructor.

52:244 Topics in Transport Phenomena 3 s.h.
Special topics in transport phenomena. May be repeated. Prerequisite: 52:144.

52:246 Transport and Reaction in Porous Media 3 s.h.
Advanced models of gaseous transport in porous media and membranes, with emphasis on modeling of chemical reactions in porous catalysts; dusty-gas model discussed at length, including experimental charterization of flux; other models, such as Feng and Stewart. Prerequisite: 52:144 or equivalent.

Materials Science

52:156 Scanning Electron Microscopy and X-Ray Microanalysis 3 s.h.
Theory, operation, and application of scanning electron microscopy and X-ray microanalysis for advanced students, staff, and investigators who use these techniques in their research. Same as 12:156, 2:156.

52:157 Transmission Electron Microscopy and X-Ray Microanalysis 3 s.h.
Theory, operation, and applications of TEM, STEM, and thin film X-ray microanalysis techniques for materials science majors; practice in a wide variety of specimen preparation techniques, including metals, glass, ceramics, and minerals. Consent of instructor required. Same as 12:165.

52:170 Microstructural Processes in Materials 3 s.h.
Structure and properties of continuous and discrete materials; topics include solid solutions, nucleation and growth, dislocations, solidification, grain boundaries, stored energy of cold work, diffusion, and recrystallization; foundation course for graduate students. Prerequisite: 57:15.

52:256 Seminar in Electron Microscopy in Materials Science 3 s.h.
Same as 12:256, 53:256.

52:257 Seminar in X-Ray Microanalysis in Materials Science 3 s.h.
New techniques, developments, and practical and theoretical aspects of EDS, WDS, and EELS; applications of ZAF, APP, LSQ, FOIL, and HALL programs on bulk materials, thin films, and powders. Consent of instructor required. Prerequisite: 52:156 or 52:157. Same as 12:273.

52:271 Advanced X-Ray Microanalysis in Materials Science 3 s.h.
Theoretical and practical aspects of X-ray microanalysis, including quantitative energy dispersive and wavelength dispersive spectrometries, and X-ray image analysis techniques on a wide range of applications using SEM, TEM, or STEM. Same as 12:271.

52:272 Advanced Scanning Electron Microscopy 3 s.h.
Theoretical and practical aspects of high-resolution scanning electron microscopy, advanced electron beam specimen interaction, image analysis and signal processing techniques in a wide variety of applications using state-of-the-art equipment. Consent of instructor required. Prerequisite: 52:156. Same as 12:272.

52:273 The Theory of Morphological Analysis 3 s.h.
Foundations and applications of morphological analysis.

Process Dynamics, Design, Analysis

52:85 Process Dynamics and Control in Design 3 s.h.
Theory and application of process dynamics to the design of chemical process control systems; mathematical models of unit operations, transfer functions, feedback and feed-forward control, stability, instrumentation, digital control systems; emphasis on computer methods, including simulation and use of commercial software; laboratory emphasizes process analysis and design. Prerequisites: 52:43 and 52:44.

52:86 Chemical Engineering Process Design 3 s.h.
Design of chemical process plants, including application of process calculations, thermodynamics, kinetics, computer-aided design, unit operations theory, process control, and economics. Prerequisite: 52:85.

52:285 Advanced Process Control 3 s.h.
Introduction to mathematical techniques for modeling and controling multiple variable systems; application of process dynamic models, including lumped parameter and distributed parameter systems; optimization of constrained and unconstrained systems, necessary and sufficient conditions for optimum control, systems identification, state-estimation, stochastic control, adaptive control, robust process control. Graduate standing required. Prerequisite: undergraduate classical control course (e.g., 52:85).

Graduate Seminars, Advanced Topics, Research

52:190 Readings in Chemical and Biochemical Engineering arr.
For graduate nonmajors who want to earn credit in undergraduate chemical engineering courses. May be repeated. Consent of instructor required. Graduate standing in a discipline other than engineering required.

52:191 Seminar in Chemical and Biochemical Engineering 0 s.h.
Presentation and discussion of recent advances and research in chemical and biochemical engineering by guest lecturers, faculty, and students. Graduate standing required.

52:195 Contemporary Topics in Chemical and Biochemical Engineering arr.
New topics or areas of study not offered in other chemical and biochemical engineering courses; topics based on faculty/student interest. Senior standing required.

52:198 Individual Investigations: Chemical and Biochemical Engineering arr.
Individual projects for chemical and biochemical engineering graduate students; may include laboratory study, engineering design project, analysis and simulation of an engineering system, computer software development, and research. Graduate standing and consent of supervising faculty adviser required.

52:199 M.S. Thesis Research: Chemical and Biochemical Engineering arr.
Experimental and/or analytical investigation of an

approved topic for partial fulfillment of the requirements for the Master of Science degree with thesis in chemical and biochemical engineering. Graduate standing and consent of faculty adviser required.

52:299 Research: Chemical and Biochemical Engineering, Ph.D. Dissertation **arr.**
Experimental and/or analytical investigation of an approved topic for the Doctor of Philosophy degree in chemical and biochemical engineering. Consent of adviser required.

CIVIL AND ENVIRONMENTAL ENGINEERING

Chair: Gene F. Parkin
Professors: Jasbir S. Arora, Dan E. Branson, Allen T. Chwang, David Forkenbrock, Edward J. Haug, Forrest M. Holly, Subhash C. Jain, Harrison Kane, John F. Kennedy, Donald B. McDonald, A. Jacob Odgaard, Gene F. Parkin, Wayne L. Paulson, R. Rajagopal, Ignacio Rodriguez-Iturbe, Jerald L. Schnoor, Ralph I. Stephens, Han-Chin Wu
Professor emeriti: Howard W. McCauley, Hunter Rouse
Associate professors: M. Asghar Bhatti, Robert Ettema, Konstantine P. Georgakakos, James W. Stoner, Richard L. Valentine, Frank H. Weirich
Assistant professors: Cheryl Contant, Witold F. Krajewski, Burton C. Kross, Wilfrid A. Nixon
Assistant professor emeritus: Neil B. Fisher
Adjunct associate professor: Tatsuaki Nakato
Adjunct assistant professors: Keith Cherryholmes, J. Kent Johnson
Undergraduate degree offered: B.S.E. in Civil Engineering
Graduate degrees offered: M.S., Ph.D. in Civil and Environmental Engineering

Civil engineering is one of the three largest fields of engineering. It traditionally has been concerned with facilities that are both large-scale and essential to modern life. Civil and environmental engineering projects include transportation systems and their components, such as bridges, highways, public transit systems, railways, harbors, airports, seaports, and even spaceports; large-scale structures and office buildings that provide enclosed working and living space; environmental and hydraulic systems that provide clean water and air, including filtration plants and distribution systems for municipal and industrial water supplies, wastewater treatment plants, dams, levees, and irrigation systems. Growth areas of civil and environmental engineering include infrastructure repair, construction management, computer-aided design, and hazardous waste treatment.

There is a critical and growing need for civil and environmental engineers. Shortages are projected for civil engineering professionals and educators in the 1990s. In the future, civil and environmental engineers will be called upon to design structures for earth and outer space, prevent erosion and sedimentation of our rivers, predict effects of global climate change on the environment, provide modern and efficient transportation systems, and ensure surface and groundwater quality.

In planning and design, civil and environmental engineers work with architects, landscape architects, planners, economists, financiers, sociologists, lawyers, and other specialists as members of the design team. Some civil engineers work in engineering offices; others may be called upon to construct or supervise outdoor projects they have designed. These field assignments, many of which are in remote and fascinating parts of the world, are particularly appealing to many civil and environmental engineers.

Undergraduate Program

Civil engineering courses build on the College of Engineering core curriculum and are designed to give students the broad educational background essential to modern civil engineering practice. Electives in the senior year permit greater breadth or additional concentration in areas of specialization such as structural and foundation engineering, environmental engineering, hydraulic engineering, and transportation engineering.

Curriculum

*The humanities and social science electives must be selected to satisfy the humanities and social sciences requirements of the College of Engineering.

Freshman Year

First Semester

4:13 Principles of Chemistry I	3 s.h.
22M:35 Engineering Calculus I	4 s.h.
57:5 Engineering I	3 s.h.
*Humanities or social science elective	3 s.h.
10:3 Rhetoric	4 s.h.
Total	17 s.h.

Second Semester

4:16 Principles of Chemistry Lab I	2 s.h.
22M:36 Engineering Calculus II	4 s.h.
22M:40 Matrix Algebra for Engineers	2 s.h.
29:17 Introductory Physics I	4 s.h.
57:6 Engineering II	3 s.h.
Total	15 s.h.

Sophomore Year

First Semester

22M:42 Vector Calculus for Engineers	3 s.h.
29:18 Introductory Physics II	4 s.h.
57:7 Statics	2 s.h.
57:9 Thermodynamics I	3 s.h.
*Humanities or social science elective	4 s.h.
Total	16 s.h.

Second Semester

22M:41 Differential Equations for Engineers	3 s.h.
57:10 Dynamics	3 s.h.
57:15 Materials Science	3 s.h.
57:19 Mechanics of Deformable Bodies	3 s.h.
*Humanities or social science elective	3 s.h.
Total	15 s.h.

Junior Year

First Semester

57:20 Mechanics of Fluids and Transfer Processes	4 s.h.
57:21 Principles of Design I	3 s.h.
22S:39 Probability and Statistics for Engineering and Physical Sciences	3 s.h.
53:30 Soil Mechanics	3 s.h.
53:32 Modern Structural Analysis	3 s.h.
53:91 Professional Seminar: Civil Engineering	0 s.h.
Total	16 s.h.

Second Semester

57:8 Electrical Circuits	3 s.h.
57:22 Principles of Design II	3 s.h.
53:35 Design of Steel Structures	3 s.h.
53:71 Principles of Hydraulics	2 s.h.
53:78 Principles of Hydrology	2 s.h.
53:91 Professional Seminar: Civil Engineering	0 s.h.
*Humanities or social science elective	3 s.h.
Total	16 s.h.

Senior Year

First Semester

53:36 Reinforced Concrete Structures	3 s.h.
53:63 Transportation Engineering	3 s.h.
53:79 Hydraulic Design	3 s.h.
53:81 Computers in Civil Engineering	3 s.h.
53:91 Professional Seminar: Civil Engineering	0 s.h.
53:150 Principles of Environmental Engineering	3 s.h.
*Humanities or social science elective	3 s.h.
Total	18 s.h.

Second Semester

53:84 Project Design and Management in Civil Engineering	3 s.h.
53:85 Experiments in Civil and Environmental Engineering	3 s.h.
53:91 Professional Seminar: Civil Engineering	0 s.h.
Technical electives	6 s.h.
*Humanities or social science elective	3 s.h.
Total	15 s.h.

Graduate Programs

The graduate program in civil and environmental engineering at both the M.S. and Ph.D. levels prepares students for professional careers and further study. The principal areas of concentration are environmental engineering and science; hydraulics; hydrology and water resources; structures, mechanics, and materials; and transportation.

Research

Environmental Engineering and Science

This curriculum provides a comprehensive base of course work and research in the areas of air- and water-quality management, environmental chemistry and microbiology, and processes for water supply, pollution control, and solid and hazardous waste management. Interdisciplinary specialization and study is conducted with programs including the Iowa Institute of Hydraulic Research, the Center for Global and Environmental Research, the Center for Health Effects of Environmental Contamination and the Departments of Chemical Engineering, Geography, Geology, Microbiology, and Preventive Medicine and Environmental Health. New areas of interdisciplinary focus include groundwater contamination, biotechnology, global climate change, and hazardous substances.

Hydraulics, Hydrology, and Water Resources

The hydraulics, hydrology, and water resources curricula are associated with the Iowa Institute of Hydraulic Research, a research organization that is world renowned. The senior staff members of the institute are professors in the program; they devote about half of their time to teaching.

The institute offers unique opportunities for students to participate actively in the research, analysis, and design aspects of real world problems. Considerable attention is given to the use of digital computers in mathematical modeling and in the acquisition and processing of data. The Computational Laboratory for Hydrometeorology and Water Resources, with its high-speed computer facilities and advanced graphics and communication software, complements the hydrology and water resources curricula.

Structures, Mechanics, and Materials

The structures, mechanics, and materials curricula are directed primarily toward computer-aided structural design, optimization, and mechanics of materials. Special strengths exist in the areas of structural optimization, computational methods, concrete and prestressed concrete structures, soil behavior, and constitutive equations for metals and geotechnical materials. Course work and research in structural design and optimization, dynamics of structures, finite element techniques, soil mechanics and foundations, concrete structures, and mechanics of materials are available.

Transportation

The transportation curriculum includes work in planning, design, construction, and operation of transportation systems and facilities. Cooperative relationships exist with the graduate programs in urban and regional planning and transportation studies. Cooperative research is conducted with the Public Policy Center, the Center for Simulation and Design Optimization, and the DOT Midwest Transportation Center. (See "Urban and Regional Planning" and "Transportation Studies" in the College of Liberal Arts section of the *Catalog*.)

Master of Science

The Master of Science programs in civil and environmental engineering are designed to permit further concentration in the area or areas of the student's choice. Graduates are placed in advanced technical positions in industry, consulting firms, or government, or they may continue their graduate study. Current and projected demand for M.S. graduates is excellent.

In general, the plan of study, with or without thesis, must include a minimum of 30 semester hours credit, with no more than 6 semester hours of credit allowed for the thesis. An additional 3 semester hours are required in the nonthesis environmental engineering curriculum.

Students, with the approval of their adviser, develop a plan of study that satisfies special requirements of their chosen curriculum.

All degree candidates are expected to have a minimum grade-point average of 3.00. They must pass an oral examination and, in some program options, a written examination.

Doctor of Philosophy

The doctoral degree is granted primarily on the basis of achievement, rather than on a prescribed course of study. Requirements for semester hours of course work vary among the specialty areas. Candidates usually need at least three years of full-time work beyond the baccalaureate degree, one year of which is devoted to the preparation of a dissertation that contributes to knowledge in the field. In some specialty areas, a qualifying examination is required for students who have not earned an M.S. in an approved curriculum. The Ph.D. program requires 72 semester hours credit beyond the baccalaureate degree. Some program options have higher requirements.

All doctoral students are required to pass a written and oral comprehensive examination before being formally admitted to candidacy for the degree. This examination usually is taken when virtually all of the student's course work has been completed.

The program culminates in a final examination, in which candidates must successfully defend their dissertation.

Doctoral candidates are expected to maintain a grade-point average of 3.20 throughout the doctoral program.

The program also cooperates in interdisciplinary doctoral programs with the program in applied mathematical sciences (see the "Division of Mathematical Sciences" in the "Liberal Arts" section of the *Catalog*).

Admission

Each curriculum of the program is quite flexible; students may be admitted from all disciplines of engineering as well as from the mathematical and basic sciences.

Applicants for the master's degree program are expected to have a cumulative undergraduate grade-point average of at least 2.75; 3.00 is preferred. For admission to candidacy for the doctorate, the minimum grade-point average is 3.20 based upon previous graduate work. Applicants whose grade-point averages are slightly lower are invited to correspond regarding admission possibility. A Graduate Record Examination General Test score of at least 1100 (verbal and quantitative) is recommended. Lower GRE General Test scores are considered with other evidence of academic promise (recommendation letters, grade-point average). GRE General Test scores are used in admission and financial aid decisions.

All applicants must meet the general admission requirements of the Graduate College (see "Graduate College" section of the *Catalog*).

Financial Aid

A significant number of research assistantships are available on a variety of research projects, as are a limited number of teaching assistantships. Selection of recipients usually is based on scholastic achievement and research interest.

Special Facilities and Laboratories

Undergraduate Instruction

Engineering Core

The freshman engineering course 57:5 Engineering I includes an introduction to the Iowa Computer-Aided Engineering Network (ICAEN), which is described under "College Facilities." Students in the course learn word processing on Macintosh microcomputers and elementary graphics using Apollo work stations. Junior students in the course Principles of Design I make extensive use of the computer hardware and software available through ICAEN.

For information about laboratories affiliated with core courses coordinated by other engineering departments, see the subsection for each of the departments.

Required and Elective Course Laboratories

- 53:30 Soil Mechanics (3 s.h.); Equipped for determining the classification, seepage characteristics, stress-strain properties, and strength of soils.

• 53:85 Experiments in Civil and Environmental Engineering (3 s.h.); Consists of experimentation in the hydraulics, environmental, and structures area; offered at the Hydraulics Laboratory, the Environmental Engineering Laboratory, and the undergraduate Structures/Mechanics/Materials Laboratory as a survey course with hands-on experimentation.

• 53:150 Principles of Environmental Engineering (3 s.h.); Used with the University Water Treatment Plant for demonstrations of unit operations and processes of water treatment and concepts in environmental chemistry and microbiology.

• 53:153 Environmental Chemistry Laboratory (3 s.h.); Part of the Environmental Engineering Laboratory; standard water and wastewater quality tests are conducted and bench scale unit processes are operated and analyzed.

• 53:155 Limnology (2-3 s.h.); Part of the Environmental Engineering Laboratory; typical aquatic organisms are studied in the laboratory and several field exercises are conducted on area streams and lakes.

Graduate Facilities and Laboratories

Environmental Engineering and Science Laboratories

Research in environmental engineering is conducted in the department's Philip F. Morgan Sanitary Engineering Research Laboratory at the Iowa City Municipal Wastewater Treatment Plant, at the Environmental Engineering Laboratory of the University Water Treatment Plant, and in the Environmental Research Laboratory at the Engineering Research Facility.

The Morgan laboratory is devoted to research activities in the wastewater treatment area. It includes a modern wet chemistry laboratory, a 10,000-gallon aeration tank, and space for bench and pilot studies of wastewater treatment.

The Environmental Engineering Laboratory is equipped for both routine and advanced chemical and biological analyses of water and provides space for both bench and pilot scale studies. The entire 4 million gallons-per-day water plant is especially designed to enable the isolation of treatment operations for special study without undue interference with the production and supply of treated water to the University.

The Environmental Research Laboratory in the Engineering Research Facility consists of 2,200 square feet of space for wet chemistry and microbiology of groundwater pollution and hazardous wastes. Three clean rooms make it possible to reach detection levels in the nanograms per liter. The laboratory is affiliated with the Center for Health Effects of Environmental Contamination, a cooperative unit of the Colleges of Engineering and Medicine, and the EPA Hazardous Substances Research Center.

Hydraulics, Hydrology, and Water Resources Laboratories

The teaching and research functions of the department are closely connected to the research and contractual activities of the Iowa Institute of Hydraulic Research and the Computational Laboratory for Hydrometeorology and Water Resources.

The institute houses some of the most modern research facilities in the world, including a 330-foot towing tank, several hydraulic flumes and wind tunnels, a dispersion flume, a wave tank, two special low-temperature flow facilities for investigation of ice phenomena, an environmental hydraulic flume for modeling of atmospheric flows, a refrigerated wind tunnel, a computer-controlled data handling system, and 2-D and 3-D laser doppler anemometers for micro-scale velocity measurements.

The Computational Laboratory for Hydrometeorology and Water Resources utilizes an Apollo DN10000 super-minicomputer (funded by NSF), several Apollo high-speed work stations, and graphic terminals and peripherals. It is a node in The University of Iowa Ethernet ultra-high-speed communication network. The laboratory has real-time links with the real-time databases of the U.S. Army Corps of Engineers, Rock Island District, and several River Forecast Centers of the National Weather Service. It is equipped with advanced graphic software, communication software, mathematical software packages, and a Geographic Information System (GIS). The laboratory is managed by a full-time data systems coordinator.

Structures, Mechanics, and Materials Laboratories

An optimal design laboratory, a plasticity laboratory, a soils laboratory, a structural testing laboratory, and an ice engineering research laboratory are available for teaching and research. The optimal design laboratory has a state-of-the-art network of Apollo work stations and other peripherals. It is used to conduct research on modern computational methods for design optimization of complex structural systems.

The structures, soils, and plasticity labs are equipped for the determination of physical and mechanical properties of metals, concrete, soils, and plastics. Equipment includes a computer-controlled MTS axial-torsional test system, universal testing machine, and a creep machine.

The ice engineering research lab has a uniaxial MTS test system with a state-of-the-art data acquisition system. There is also a Tinnius Olson testing machine, two ice tanks, a milling machine (in a cold room for preparation of ice samples), and a variety of other equipment to allow testing of the mechanical properties of ice and of ice/structure interaction processes.

Courses

Special

53:000 Cooperative Education Training Assignment: Civil Engineering **0 s.h.**
Civil engineering students participating in the Cooperative Education Program register in this course during work assignment periods; registration provides a record of participation in the program on the student's permanent record card. Admission to the Cooperative Education Program and consent of faculty adviser required.

53:81 Computers in Civil Engineering **3 s.h.**
Mini- and microcomputer applications in civil engineering; spreadsheets, database management, expert systems, computer graphics, recent developments in software and hardware; individual and team projects selected from structures, hydraulics, transportation, and environmental engineering.

53:83 Surveying and Remote Sensing **3 s.h.**
Engineering surveying measurements, methods, and computations. Prerequisite: 57:5.

53:84 Project Design and Management in Civil Engineering **3 s.h.**
Design of civil engineering systems, individual and team design projects oriented toward the solution of local problems, project management, construction management, contracts, budgeting, and bidding. Prerequisites: 57:21 and 57:22.

53:85 Experiments in Civil and Environmental Engineering **3 s.h.**
Basic laboratory procedures in civil and environmental engineering, with emphasis on hydraulics, environmental studies, and materials testing. Prerequisites: 53:32, 53:71, and 53:150.

53:91 Professional Seminar: Civil Engineering **0 s.h.**
Professional aspects of civil engineering presented through lectures and discussions by guest speakers, field trips, films, and panel discussions. May be repeated. Junior standing required.

53:98 Individual Investigations: Civil Engineering **arr.**
Individual projects for civil engineering undergraduate students, such as laboratory study, engineering design project, analysis and simulation of an engineering system, computer software development, and research. Consent of faculty adviser required.

53:103 Hydrogeology and Ground Water Quality **3 s.h.**
Quantity and quality aspects of groundwater flow; wells, pumping tests, flow nets, water chemistry, aquifer contamination, mathematical modeling; includes lab and field experiments. Senior or graduate standing in engineering or geology required. Same as 12:166.

53:111 Numerical Calculations **3 s.h.**
Development of algorithms for functional approximations, numerical differentiation, and integration; solution of algebraic and differential equations, with emphasis on digital computations; initial and boundary value problems. Prerequisite: 22M:41. Same as 58:111.

53:113 Mathematical Methods in Engineering **3 s.h.**
Matrices, vector spaces, eigenvalue problems, quadratic forms, series solutions of differential equations, special functions, function spaces, Fourier series, equations of mathematical physics, multiple integral theorems, and first- and second-order partial differential equations. Prerequisites: 22M:40, 22M:41, and 22M:42. Same as 58:113.

53:115 Computer-Aided Engineering **3 s.h.**
Fundamentals of computer graphics, visualization of engineering design and analysis data, solid modeling, window-based user interface development; applications of these techniques to engineering problems. Prerequisite: working knowledge of FORTRAN or PASCAL. Same as 58:110.

53:204 Theories of Environmental Policy and Assessment **3 s.h.**
Major concerns about the environment and human health and the basis on which legislation has been enacted to deal with these concerns; emphasis on contemporary legislation that has major effects on environmental policy. Prerequisite: 53:150. Same as 63:252.

53:212 Analytical Methods in Thermo-Fluid Mechanics 3 s.h.
Theory and solution techniques for first- and second-order partial differential equations; wave equation; Laplace equation; heat equation; Navier-Stokes and Energy equations; calculus of variations—Euler-Lagrange equation, Sturm-Liouville problems, Rayleigh-Ritz method; variational methods in thermo/fluids; integral equations—Green's functions, Volterra and Abel equations, Fredholm equations. Prerequisite: 53:113. Same as 58:212.

53:214 Analytical Methods in Mechanical Systems 3 s.h.
Functional analysis applied in mechanics and dynamics; calculus of variations; variational methods such as Ritz and Galerkin methods; ordinary differential equations; boundary and initial value problems; stability theorem; perturbation of linear systems. Prerequisite: 53:113. Same as 58:214.

Structures, Mechanics, and Materials

53:30 Soil Mechanics 3 s.h.
Identification and classification of earth materials; hydraulic and mechanical properties of soils; soil improvement; laboratory testing. Prerequisite: 57:19.

53:32 Modern Structural Analysis 3 s.h.
Fundamental principles of structural analysis applied to statically determinate and indeterminate beams, trusses, and frames; external and internal equilibrium, compatibility of deformation, influence lines; parallel use of classical and matrix formulation; flexibility and stiffness methods; use of computers. Prerequisite: 57:19.

53:35 Design of Steel Structures 3 s.h.
Concepts and procedures in structural design; load and resistance factors; design of tension members, beams, columns, and connections; composite design; computer applications. Prerequisite: 57:19.

53:36 Reinforced Concrete Structures 3 s.h.
Fundamental analysis and design of reinforced concrete members and structures; flexure, shear, bond, torsion, continuity, deflections, yield-line theory; beams, one-way and two-way slab systems, columns, retaining walls, footings, composite members; use of computers. Corequisite: 53:32.

53:131 Advanced Structural Analysis I 3 s.h.
Statically indeterminate structures, including continuous beams and trusses, grids, frames with sloping members, multibay and multistory frames; classical and matrix formulation; column analogy, slope deflection, moment distribution; emphasis on matrix flexibility and stiffness methods; influence lines, virtual work, classical theorems, numerical procedures, plate flexure; use of computers. Prerequisite: 53:32.

53:132 Fundamentals of Vibrations 3 s.h.
Fundamental aspects of the vibration of linear discrete and continuous mechanical and structural systems; harmonic, periodic, and arbitrary excitation; modal analysis; applications. Prerequisite: 57:19. Same as 58:153.

53:133 Finite Element Techniques in Engineering I 3 s.h.
Introduction to the finite element method; basic concepts; one- and two-dimensional boundary value problems; applications to heat transfer and fluid flow; stress analysis, axial deformation, bending, torsion problems; two-dimensional elasticity problems; introduction to plate bending and shells; practical applications using commercially available software. Prerequisite: 57:19. Same as 58:115.

53:136 Computer Aided Structural Design 3 s.h.
Design of steel and reinforced concrete high-rise buildings using computers, large-span space structures, plastic design, optimal design; design project required. Prerequisite: 53:32.

53:138 Prestressed Concrete Structures 3 s.h.
Initial and time-dependent deformation of concrete structures; analysis and design of statically determinate and indeterminate prestressed concrete structures; flexure, shear, torsion, deflections; beams, slabs, composite members, columns, tension members, buildings, bridges, tanks, shells; use of computers. Prerequisite: 53:32.

53:139 Foundations of Structures 3 s.h.
Application of soil mechanics to foundations of buildings; subsurface exploration; bearing capacity and settlement analyses; design of shallow and deep foundations; stability of earth slopes; earth pressures and retaining walls; braced cuts. Prerequisite: 53:30.

53:140 Intermediate Mechanics of Deformable Bodies 3 s.h.
Application of equilibrium analyses, strain-displacement relations and constitutive relationships to practical structural systems and elementary plane elasticity problems. Prerequisite: 57:19. Same as 51:151, 58:150.

53:149 Theories of Failure in Design 3 s.h.
Definition and criteria for failure, yield phenomena, linear elastic fracture mechanics, plane stress and plane strain fracture toughness, J-integral, COD, fatigue, safe-life, fail-safe, damage tolerant design, corrosion, and creep-rupture design. Prerequisites: 57:19; 58:55 or 53:140 or equivalent. Same as 58:159.

53:232 Structural Dynamics 3 s.h.
Modeling for dynamic analysis; direct integration methods, large-scale eigenvalue solvers; earthquake and wind loading; random vibrations; offshore structures; recent developments; practical applications using commercially available software. Prerequisites: 53:132 and 53:133.

53:233 Finite Element Techniques in Engineering II 3 s.h.
Advanced topics in finite element method; convergence considerations; higher order elements; solids of revolution; plate bending; nonlinear analysis; programming aspects; recent developments. Prerequisite: 53:133. Same as 58:215.

53:234 Advanced Structural Analysis II 3 s.h.
Analysis of complex elastic and inelastic structures; numerical methods; space structures, plates, beam-columns, spring-support problems, suspension structures; wind analysis. Prerequisite: 53:131.

53:235 Applied Optimal Design 3 s.h.
Optimal design problem formulation; necessary and sufficient conditions of optimality; unconstrained optimization algorithms; linear, quadratic, and nonlinear programming; modern computer-aided optimal design algorithms; emphasis on design applications. Prerequisite: 53:113.

53:236 Optimization of Structural Systems 3 s.h.
Advanced topics in structural optimization; finite element structures, substructuring, fail-safe design; finite dimensional dynamic response optimization; sensitivity analysis; worst-case design; distributed parameter systems, calculus of variation; computer applications. Prerequisite: 53:235.

53:241 Continuum Mechanics and Elasticity 3 s.h.
Cartesian tensors and geometrical foundations; concept of stress, strain, and motion; fundamental physical laws; constitutive equations and finite elasticity; equations of linear elasticity, elastic extension, torsion and bending of bars. Prerequisites: 53:113 and 53:140. Same as 58:251.

53:242 Topics in Solid Mechanics 3 s.h.
Plane theory of elasticity; stress around a crack tip; flow theory of plasticity and application; crack-tip plastic zone; simple mechanical models of viscoelastic behavior. Prerequisites: 53:113 and 53:140, or equivalent. Same as 58:255.

53:244 Energy Principles in Structural Mechanics 3 s.h.
Principles of virtual work, stationary and minimum potential energy; calculus of variations; Ritz method, Galerkin's method; beams and plates; Hamilton's principle; elastic stability;

53:246 Continuum Mechanics and Plasticity 3 s.h.
Finite strain measures and rate of deformation; principles of isotropy and materials indifference; constitutive equations of elastic and inelastic materials; internal variable theory of thermodynamics; endochronic theory of plasticity. Prerequisite: 53:241 or equivalent. Same as 58:258.

53:247 Theory of Viscoelasticity 3 s.h.
Linear theory of viscoelasticity; nonaging materials; Boltzmann superposition principle, linear functionals; thermodynamic foundations; time-temperature superposition principle; boundary and initial value problems. Prerequisite: 53:140 or 53:241. Same as 51:257, 58:257.

53:248 Stability of Structural Systems 3 s.h.
Variational methods, stability criterion, elastic and inelastic buckling, columns, beams, plates, rigid frames, torsional and torsional-flexural buckling, lateral buckling, approximate methods, buckling of shells. Prerequisite: 53:244.

Environmental Engineering and Science

53:150 Principles of Environmental Engineering 3 s.h.
Physical, chemical, and biological principles of water supply and pollution control, air pollution control, and solid wastes management. Prerequisites: 4:13, 53:71, and 53:78.

53:151 Biological Treatment Processes 3 s.h.
Applied microbiology and fundamental principles of aerobic and anaerobic biological wastewater treatment processes; sludge processing and advanced wastewater treatment; lectures and laboratory. Prerequisites: 53:150 and 53:154. Corequisite: 53:156.

53:152 Environmental Chemistry 3 s.h.
Principles of general, physical, and organic chemistry applied in water and air systems; emphasis on qualitative and quantitative understanding of chemical kinetics and equilibrium; acid-base reactions, complex formation, precipitation, dissolution, and oxidation-reduction reactions; organic nomenclature. Prerequisite: 4:13. Same as 52:152.

53:153 Environmental Chemistry Laboratory 3 s.h.
Laboratory experiments to demonstrate important concepts in environmental chemistry and to familiarize students with procedures used to characterize water and wastewater and evaluate certain treatment processes. Corequisite: 53:152.

53:154 Environmental Microbiology 3 s.h.
Fundamentals of microbiology with application in water quality and wastewater treatment systems; lectures and laboratory. Corequisite: 53:152.

53:155 Limnology 2-3 s.h.
Physical, chemical, and biological characteristics of natural waters, with emphasis on the effects of human activities on the aquatic environment; lectures and laboratory. Prerequisite: 53:154.

53:156 Physical-Chemical Treatment Processes 3 s.h.
Theory of physical and chemical operations and processes in water and wastewater treatment; lectures and laboratory. Prerequisites: 53:150 and 53:152.

53:157 Environmental Engineering Design 3 s.h.
Application of physical, chemical, and biological operations and processes to the design of water and wastewater treatment systems; applications in solid and hazardous waste treatment. Prerequisites: 53:150, 53:151, and 53:156.

53:158 Solid and Hazardous Wastes 3 s.h.
Sources, characteristics, collection, and disposal of solid and hazardous wastes; environmental impacts of hazardous waste management; resource recovery systems. Prerequisite: 53:150.

53:159 Air Pollution Control Technology 3 s.h.
Sources, environmental and health impacts, regulations, and modeling of air pollution; processes and alternative strategies for control; global climate considerations. Prerequisite: 53:150. Same as 52:159.

53:160 Modeling Analysis 3 s.h.
Application of numerical analysis to transport phenomena, chemical kinetics, and reactor design; emphasis on model formulation and numerical solution; ordinary and partial differential equations. Prerequisite: 52:144 or equivalent. Same as 52:147.

53:161 Atmospheric Chemistry and Physics 3 s.h.
Principle chemical and physical processes that affect atmospheric trace gas and pollutant cycles; emphasis on atmospheric photochemistry, aerosol science, major sources and removal processes. Consent of instructor required. Same as 52:163.

53:251 Environmental Systems Modeling 3 s.h.
Mathematical modeling of environmental systems including rivers, lakes, estuaries, and treatment systems for conventional and toxic pollutants. Prerequisites: 53:150 and 53:152.

53:252 Advanced Environmental Chemistry 3 s.h.
Lectures and laboratory on advanced concepts and instrumental methods in the analysis of environmental samples. Prerequisites: 53:152 and 53:153.

53:254 Environmental Toxicology 3 s.h.
The nature, sources, and pathways of toxic substances in the environment and their impact on humans and other life forms. Prerequisite: 53:154.

53:256 Seminar in Electron Microscopy in Materials Science 3 s.h.
Practical and theoretical aspects of high-resolution SEM, BSEM, STEM; advanced electron beam/specimen interaction and Monte Carlo simulation techniques; X-ray elemental mapping and image analysis; signal processing techniques. Same as 12:256, 52:256.

53:257 Industrial Wastewater and Hazardous Wastes Control 3 s.h.
Sources, characteristics, and treatment of industrial wastewaters to meet environmental standards. By-product and reuse applications; hazardous waste management and control processes. Prerequisites: 53:150, 53:151, and 53:156.

Transportation

53:63 Transportation Engineering 3 s.h.
History of transportation, regulation and control of services, roadway construction and design, new technologies, operating and control strategies, economic evaluation of transport alternatives, and route location. Prerequisite: 57:20.

53:163 Transportation Systems Analysis 3 s.h.
Transportation systems management and traffic engineering; intersection design; development of network models and discrete simulations; topics in transport systems evaluation; network optimization and transit scheduling. Same as 102:263.

53:262 Urban Transportation Planning 3 s.h.
Application of city planning procedures and traffic engineering techniques to solution of transportation problems; travel characteristics, forecasting methods, trip generation, distribution, and assignment models. Prerequisite: 22S:39. Same as 102:262.

Hydraulics, Hydrology, and Water Resources

53:71 Principles of Hydraulics 2 s.h.
Hydraulics of pressure conduits and open channels, dimensional analysis, flow measurements, hydraulic machinery. Prerequisite: 57:20.

53:78 Principles of Hydrology 2 s.h.
Elements of hydrology, groundwater hydraulics, flood flows, and typical water resource systems. Prerequisite: 57:20. Corequisite: 53:71.

53:79 Hydraulic Design 3 s.h.
Storage reservoirs, design of dams and control works, and water and wastewater transfer systems; computer applications. Prerequisites: 53:71, 53:78, and 22S:39.

53:116 Probabilistic Methods in Hydroscience 3 s.h.
Common probabilistic models used in hydrology, hydraulics, and water resources; derived distributions; multivariate models and estimation of model parameters; analysis of data and model building. Prerequisites: 22M:42 and 22S:39.

53:169 Intermediate Mechanics of Fluids 3 s.h.
Basic concepts and definitions; pressure distribution in a fluid; governing equations and boundary conditions; integral and differential analysis; dimensional analysis and similarity; experimental analysis; laminar and turbulent internal and external flows; potential flows; engineering applications. Prerequisite: 57:20. Same as 58:160.

53:170 Flow in Open Channels 3 s.h.
Energy and momentum principles in open channel flow; uniform flow; gradually varied flow; rapidly varied flow; unsteady flow; flood routing. Prerequisite: 53:71.

53:171 Water Resources Engineering 3 s.h.
Planning and economics of water resources projects; river morphology; reservoirs; flood control; river navigation works; hydraulic machinery; hydroelectric power systems; survey of selected topics. Prerequisites: 57:20 and 53:78.

53:172 Experimental Methods in Fluid Mechanics and Heat Transfer 3 s.h.
Review of theory; importance of experiments; modeling and scaling laws; experimental environment and facilities; measurements at full scale and on scaled models; use of wind and water tunnels, towing tanks, and hydraulic flumes; instruments for measuring pressure, temperature, velocity, and turbulence; error analysis; data acquisition and processing; laboratory demonstrations, hands-on experiments, project. Prerequisite: 58:80 or equivalent. Same as 58:162.

53:173 Mechanics of Sediment Transport 2-3 s.h.
Laws governing fall velocity, applications to particle-size analysis; incipient motion, bed forms, bed load, suspended load, natural river processes; theory and practice of movable-bed model experiments. Prerequisite: 53:170.

53:174 Advanced Hydraulic Design 3 s.h.
Classification and functions of hydraulic structures; selection of type of dam, hydraulic design of spillways, energy dissipators, gates, outlet works, canal, and other water conveyance structures, and municipal and industrial outfall structures. Prerequisite: 53:79.

53:175 Groundwater Hydrology and Contaminant Transport 2-3 s.h.
Governing equations of groundwater flow through porous media; interaction of surface and groundwater flows; groundwater contaminant transport; numerical methods, parameter estimation applications to groundwater models; hydraulics of wells; analysis of seepage through dams, seepage from canals, and land-drainage systems. Prerequisite: 53:169.

53:177 Theory and Practice of Hydraulic Modeling 2 s.h.
Theoretical bases for hydraulic models developed from governing equations; theory of dimension analysis; practical aspects of construction and operation of Froude and Reynolds models; modeling of hydraulic machinery, rivers, tidal flows, heated discharges, and ice phenomena; modern instrumentation and data-handling techniques. Prerequisite: 53:71.

53:178 Hydrometeorology 3 s.h.
History; meteorology; precipitation; streamflow; evaporation; infiltration; groundwater; hydrographs, runoff relations; runoff hydrography; storage problems; flood routing; frequency, intensity, and duration studies of storms, floods, and droughts; watershed modeling; urban hydrology. Prerequisite: 53:78.

53:179 Porous Media Hydrodynamics 2 s.h.
Hydrodynamics of porous media flow and related governing equations and boundary conditions; analysis of wells, seepage, drainage, recharge, multiple-phase flow. Prerequisite: 53:169 or equivalent.

53:270 Coastal Hydrodynamics 3 s.h.
Waves, tides, harbor oscillations; coastal structures, estuary dynamics, salinity intrusion, and sediment transportation in estuaries; beach processes and evolution. Prerequisite: 53:169.

53:271 Hydraulic Transients 3 s.h.
Unsteady flow in closed conduits; method of characteristics; transients caused by centrifugal pumps; transients in power plants; resonance; transient cavitation; surge tanks; transients in open channels. Prerequisites: 53:169 and 53:170.

53:272 Environmental Dispersion Processes 3 s.h.
Review of classical diffusion theories; longitudinal dispersion, transverse and vertical mixing in free-surface turbulent shear flow; application to natural channels; selected topics including stream-tube models, mixing and dispersion of heated effluents. Corequisite: 53:169.

53:273 Computational Hydraulics 3 s.h.
General review of numerical methods; one-dimensional unsteady flow; quasi-two-dimensional unsteady flow; unsteady dispersion in rivers; water and sediment routing in rivers; calibration. Prerequisites: 53:169 and 53:170.

53:276 Viscous Flow 3 s.h.
Equations of compressible viscous flow; classical exact analytical and numerical solutions; flow regimes and approximations; laminar boundary layers: equations, solution methods, and applications; introduction to stability theory; incompressible turbulent flow: mean-flow and Reynolds-stress equations, modeling, solution procedures, and applications; introduction to compressible boundary layers. Prerequisite: 53:169. Same as 58:260.

53:277 Inviscid Flow 3 s.h.
Flow of an inviscid, incompressible fluid; steady and unsteady, two- and three-dimensional flows, irrotational flows; forces and moments acting on bodies; conformal mapping; method of images; separation of variables; slender body theory; Green's functions and integral equations; numerical methods; inviscid compressible flow; shock waves. Prerequisite: 53:169. Same as 58:262.

53:280 Hydrosystems Design and Operation 3 s.h.
Flood frequency analysis; design of sampling networks; derived distributions of hydrologic variables; real-time hydrometeorologic forecasting; statistical inference applications to surface and groundwater models; stochastic optimization of water resources systems; multiobjective analysis. Prerequisites: 53:116 and 53:178.

Graduate Seminars, Advanced Topics, Research

53:190 Readings in Civil and Environmental Engineering arr.
For graduate nonmajors who want to earn credit in undergraduate civil and environmental engineering courses. May be repeated. Graduate standing in a discipline other than engineering and consent of instructor required.

53:191 Graduate Seminar: Structures, Mechanics, Materials 0 s.h.
Presentation and discussions of recent advances and research in structures, mechanics, and materials engineering by guest lecturers, faculty, and students. Senior or graduate standing required.

53:192 Environmental Engineering Seminar 0 s.h.
Presentation and discussion of current topics, case studies, and research in environmental science and engineering by students, guest lecturers, and faculty. Senior or graduate standing required.

53:193 Graduate Seminar: Hydraulics, Hydrology, and Water Resources 0 s.h.
Presentation and discussions of recent advances and research in hydraulics, hydrology, and water resources by guest lecturers, faculty, and students. Senior or graduate standing required.

53:195 Contemporary Topics in Civil and Environmental Engineering arr.
New topics or areas of study not formally offered in other civil and environmental courses; ice engineering, chaos and strange attractors, remote sensing, nonlinear dynamics of hydrologic processes, advanced water and wastewater treatment processes, hazardous waste control, global climate change, damage mechanics; based on faculty/student interest. Senior standing required.

53:198 Individual Investigations: Civil and Environmental Engineering arr.
Individual projects for civil and environmental engineering graduate students: a laboratory study, engineering design project, analysis and simulation of an engineering system, computer software development, research. Graduate standing and consent of faculty adviser required.

53:199 Research: Civil and Environmental Engineering, M.S. Thesis arr.
Experimental and/or analytical investigation of an approved topic for partial fulfillment of requirements for the M.S. degree with thesis in civil and environmental engineering. Graduate standing and consent of faculty adviser required.

53:299 Research: Civil and Environmental Engineering, Ph.D. Dissertation arr.
Experimental and/or analytical investigation of an approved topic for partial fulfillment of requirements for the Ph.D. degree in civil and environmental engineering. Consent of faculty adviser required.

ELECTRICAL AND COMPUTER ENGINEERING

Chair: Sudhakar M. Reddy
Professors: Susan D. Allen, Dong H. Chyung, Steve M. Collins, Earl D. Eyman, Adrianus Korpel, Karl E. Lonngren, Norbert R. Malik, Sudhakar M. Reddy, John P. Robinson, David J. Skorton, Arthur L. Smirl
Associate professors: Robert Cuykendall, Soura Dasgupta, Jon G. Kuhl
Associate professor emeritus: Everett D. Alton
Assistant professors: Mark S. Andersland, David R. Andersen, Thomas L. Casavant, Salim U. Chowdhury, Anjan K. Ghosh, Glenn A. Myers
Visiting assistant professors: Tarek Abdelrahman, Er-Wei Bai
Undergraduate degree offered: B.S.E. in Electrical Engineering
Graduate degrees offered: M.S., Ph.D. in Electrical and Computer Engineering

From its early beginnings of electrical power generation and distribution, electrical engineering has evolved through telephone, radio, and television to microelectronics and modern computers.

Electricalengineering is concerned with the generation, measurement, transmission, processing, and control of electrical energy and of information in the form of electrical signals. The important role of the digital computer in these activities is emphasized by the program title, electrical and computer engineering.

Graduates of the program are employed in semiconductor, aerospace, telecommunication, radio, television, computer, and power industries. The electrical engineer works in design, development, manufacturing, sales, market analysis, consulting, field service, and management. The employment outlook for the foreseeable future is quite favorable.

Undergraduate Program

The electrical and computer engineering program provides a strong background in basic electrical and computer engineering subjects, physics, and mathematics and allows for concentration in several areas through five technical elective courses usually taken in the senior year. Students can concentrate in one or more areas chosen from computers, control, communication, electronics, and applied physics.

Curriculum

*The humanities and social science electives must be selected to satisfy the humanities and social science requirements of the College of Engineering.

**55:91 Professional Seminar: Electrical Engineering must be taken once in the junior year and once in the senior year.

Freshman Year

First Semester

4:13 Principles of Chemistry I	3 s.h.
10:3 Rhetoric	4 s.h.
22M:35 Engineering Calculus I	4 s.h.
57:5 Engineering I	3 s.h.
*Humanities or social science elective	3 s.h.
Total	17 s.h.

Second Semester

4:16 Principles of Chemistry Lab I	2 s.h.
22M:36 Engineering Calculus II	4 s.h.
22M:40 Matrix Algebra for Engineers	2 s.h.
29:17 Introductory Physics I	4 s.h.
57:6 Engineering II	3 s.h.
Total	15 s.h.

Sophomore Year

First Semester

22M:41 Differential Equations for Engineers	3 s.h.
29:18 Introductory Physics II	4 s.h.
57:7 Statics	2 s.h.
57:8 Electrical Circuits	3 s.h.
57:9 Thermodynamics I	3 s.h.
Total	15 s.h.

Second Semester

22M:42 Vector Calculus for Engineers	3 s.h.
57:12 Linear Systems Analysis	3 s.h.
57:17 Computers in Engineering	3 s.h.
57:18 Principles of Electronic Instrumentation	4 s.h.
*Humanities or social science elective	3 s.h.
Total	16 s.h.

Junior Year

First Semester

22S:39 Probability and Statistics for the Engineering and Physical Sciences	3 s.h.
55:32 Introduction to Digital Design	3 s.h.
55:40 Electronic Circuits	3 s.h.
55:42 Signals and Systems	3 s.h.
**55:91 Professional Seminar: Electical Engineering	0 s.h.
*Humanities or social science elective	3 s.h.
Total	15 s.h.

Second Semester

55:33 Introduction to Software Design	3 s.h.
55:50 Communication Systems	3 s.h.
55:60 Control Systems	3 s.h.
55:70 Electromagnetic Theory	3 s.h.
55:84 Principles of Electrical Engineering Design I	3 s.h.
Total	15 s.h.

Senior Year

First Semester

55:72 Electrical Engineering Materials and Devices	3 s.h.
55:85 Principles of Electrical Engineering Design II	2 s.h.
**55:91 Professional Seminar: Electrical Engineering	0 s.h.
Technical electives (see "Technical Electives" below)	9 s.h.
*Humanities or social science elective	3 s.h.
Total	17 s.h.

Second Semester

29:83 Modern Physics	3 s.h.
55:86 Principles of Electrical Engineering Design III	2 s.h.
Technical electives (see "Technical Electives" below)	9 s.h.
*Humanities or social science elective	4 s.h.
Total	18 s.h.

Technical Electives

Technical electives must include at least two of the following.

55:35 Computer Architecture and Organization	3 s.h.
55:68 Power Systems Analysis	3 s.h.
55:130 Switching Theory	3 s.h.
55:131 Introduction to VLSI Design	3 s.h.
55:137 Microcomputer-Based Systems	3 s.h.
55:138 Testing Digital Logic Circuits	3 s.h.
55:139 Design Automation of Digital Systems	3 s.h.
55:141 Power Electronics	3 s.h.
55:143 Linear Integrated Electronics	3 s.h.
55:144 Digital Integrated Electronics	3 s.h.
55:146 Digital Signal Processing	3 s.h.
55:148 Digital Image Processing	3 s.h.
55:150 Communication Theory	3 s.h.
55:152 Introduction to Information and Coding Theories	3 s.h.
55:160 Control Theory	3 s.h.
55:164 Computer-Based Control Systems	3 s.h.
55:165 Introduction to Robotics	3 s.h.
55:172 Solid State Physical Electronics	3 s.h.
55:178 Optical Signal Processing	3 s.h.
57:21 Principles of Design I	3 s.h.
57:22 Principles of Design II	3 s.h.

Graduate Programs

Electrical and computer engineering offers curricula leading to the Master of Science and Doctor of Philosophy degrees. Thesis and nonthesis M.S. programs are available; either may precede Ph.D. studies. Excellence in scholarship and research is stimulated by close contact with the faculty throughout the period of graduate study and through programs tailored to fit individual needs.

Students select an adviser and, with the adviser, plan an individual program bounded only by a few broad guidelines imposed by the Graduate College and by the program. Close interdisciplinary ties with other departments exist both within and outside the college, especially with the Departments of Internal Medicine, Radiology, Physics, Computer Science, Mechanical Engineering, and Biomedical Engineering. The principal areas of concentration are waves and materials, computer systems, signal and image processing, and control systems and robotics. Each is briefly described here.

Research

Waves and Materials

Plasma physics, electro-optics, nonlinear optics, optical signal processing, and acoustics investigations utilize specialized laboratories in both the Engineering Building and Van Allen Hall. Collaborative research with the physics department is directed toward topics in nonlinear plasma physics of a theoretical as well as experimental nature. These topics include plasma confinement and stability and nonlinear wave phenomena, such as solitons and shocks. A plasma physics

laboratory is available to support this activity. An electro-optic laser laboratory and an ultrasonic facility are used to conduct graduate research in the area of optics/acoustics; especially acousto-optics and nonlinear wave phenomena in ultrasonics.

In the area of nonlinear optics, investigations of both an experimental and a theoretical nature are ongoing. There is a laboratory for experimental investigations of the nonlinear optical properties and device applications of various materials. Extensive use is made of the NCSA Cray X-MP/48 to conduct numerical studies of various nonlinear optical problems.

In the area of optical signal processing, projects involve the use of optical fibers and various light modulators to build special purpose analog processors for parallel computation and signal manipulation. A small associative optical processor is being developed in the optical processing laboratory.

Computer Systems

Research emphasis is directed toward design of highly reliable computer systems, distributed computing, parallel processing, and nonstandard computers. Areas of interest include fault-tolerant computing, applications of large-scale distributed and parallel processing, coding, VLSI design, computer graphics, optical computers, and neural networks.

This work is supported by departmental facilities including several super-minicomputer systems and a number of graphics work stations, as well as through a network connection to collegiate and University facilities, including those of Weeg Computing Center and the University High-Speed Computing Facility. Network access to National Supercomputer Centers also is used.

Current projects include design of easily testable, very-large-scale integrated circuits; parallel CAD algorithms for VLSI; applications of distributed/parallel processing and graphics for real-time rendering; performance evaluation of parallel computers; software tools for developing parallel and distributed programs; display of animated images; neural networks; and optical computing.

Signal and Image Processing

Cardiovascular signal and image processing, signal processing associated with speech and hearing, estimation theory, and adaptive signal processing currently are active areas. Collaborative efforts involve the Department of Biomedical Engineering and the College of Medicine. A digital signal processing laboratory and a cardiovascular image processing laboratory, the latter located at the cardiovascular center in The University of Iowa Health Center, are available to support this research. Recent problem investigations have included image processing, detection of cardiac motion, efficient coding and transmission of speech, speech processing aids for the hearing-impaired, edge detection, and analysis and design of efficient adaptive algorithms for signal processing and communications problems.

Control Systems and Robotics

Current research emphasizes optimal control, learning and adaptive control, self-repairing systems, digital control, multi-arm robot manipulation, and sensor-based robotics. Work also is being done in estimation, identification, and robust controls for linear and nonlinear dynamic systems. A modern control systems research laboratory supports this effort. Other topics include applications of stochastic processes to problems in control and communication systems such as spectral estimation, identification, adaptive filtering and control for stochastic dynamical systems.

Master of Science

There are two M.S. degree options: with and without thesis. The thesis option requires 30 semester hours of course work, including at least 12 semester hours from an approved list of courses in electrical and computer engineering. The nonthesis option requires 36 semester hours of course credit, with a minimum of 18 semester hours from an approved list of courses in electrical and computer engineering. The M.S. semester-hour requirements do not include courses required for electrical engineering undergraduates. With thesis, up to 8 semester hours of the 30 may be research credit. At least 6 semester hours of credit must be earned in 55:199 Research in Electrical and Computer Engineering, M.S. Thesis by students in the thesis option. Without thesis, a total of not more than 3 semester hours of independent study credit may be included in the required 36-semester-hour total.

Candidates for the master's degree in electrical and computer engineering also must successfully complete a final examination, which is conducted by a committee of at least three faculty members. One part of the final examination for thesis candidates must consist of an oral defense of the thesis. At the time of graduation, candidates for the master's degree must have acquired a cumulative grade-point average of 3.00 or higher.

Doctor of Philosophy

Requirements are:

- At least 72 semester hours of credit in a coherent program acceptable to the adviser and approved by the graduate committee, with at least 45 semester hours of credit earned in formal courses (not thesis or other independent study), including 30 semester hours from an approved list of courses in electrical and computer engineering;
- Successful completion of the Ph.D. qualifying examination;
- Successful completion of the Ph.D. comprehensive examination;
- Successful completion of a research program that includes a minimum of 18 semester hours of Ph.D. research;
- Successful completion of a final oral defense of the thesis and a cumulative grade-point average of 3.25 or higher in graduate course work.

The Ph.D. qualifier examination, taken just after students have completed 30 semester hours of graduate work, is an all-day examination that requires students to solve problems from four out of five specified areas plus one individual area. The qualifier examination has two purposes: to eliminate very early students who are not qualified to pursue Ph.D. studies, and to enforce minimal standards of breadth in students' overall plan of study. After students pass this examination, their adviser and Ph.D. committee have primary responsibility for the design of their subsequent plan of study. The qualifier examination is given once a year; students have two chances to pass it. A comprehensive examination including a dissertation proposal follows within three calendar years of the qualifier, and the program ends with a final oral thesis defense.

Admission

The usual requirement for admission to the graduate program is a grade-point average of at least 2.70 for M.S. students and 3.25 for Ph.D. students on all courses in electrical and computer engineering, mathematics, and physics. M.S. students with a grade-point average less than 2.70 but better than 2.50 in courses in electrical and computer engineering, mathematics, and physics may be admitted on probation.

Students with baccalaureate degrees in related areas (e.g., physics, mathematics, and computer sciences) may be admitted. In such cases, additional course work without graduate credit may be required.

Each application is reviewed on an individual basis. Extenuating circumstances may permit deviations from the usual standards.

Financial Aid

A number of fellowships, traineeships, assistantships, scholarships, and industrial grants are available to graduate students who qualify. These are awarded on a competitive basis.

Special Facilities and Laboratories

Undergraduate Instruction

Engineering Core

Electrical and computer engineering provides core instruction for the college in systems, electrical circuits, and electronics.

A key part of this core teaching responsibility lies in providing the students of the college with their first experience with engineering laboratory instrumentation. The electronics laboratory facilities are equipped with oscilloscopes, signal generators, analog and digital breadboarding equipment, and a variety of measuring instruments.

Required and Elective Course Laboratories

The undergraduate laboratories consist of the traditional electronics laboratories plus special laboratories for minicomputers, microcomputers, and construction of hybrid solid state devices.

Graduate Facilities and Laboratories

The department has excellent computing facilities supported by two VAX 750 systems with large RAM and disc storage, five Apollo work stations, two of which are color, a VAX 725 system, and several Macintosh personal computers. Over thirty alphanumeric and graphics terminals (including high-resolution smart color terminals) are available for accessing departmental, college, and University computers. Several laser printers and two electrostatic printers are available for production of high-quality hard copies.

Courses

Special

55:000 Cooperative Education Training Assignment: Electrical Engineering **0 s.h.**
Electrical engineering students participating in the Cooperative Education Program register in this course during work assignment periods; registration provides a record of participation in the program on the student's permanent record. Consent of cooperative faculty adviser required. Admission to the Cooperative Education Program required.

55:84 Principles of Electrical Engineering Design I **3 s.h.**
Design problems in electrical engineering with emphasis on small-scale and medium-scale integrated circuits, advanced amplifiers, and application of discrete devices (e.g., FETs, BJTs). Prerequisites: 55:32 and 55:40.

55:85 Principles of Electrical Engineering Design II **2 s.h.**
Design problems requiring integration of subject matter from other required E.C.E. courses. Prerequisite: 55:84. Corequisites: 55:33, 55:50, and 55:60.

55:86 Principles of Electrical Engineering Design III **2 s.h.**
Final design course; individual or team project of student's choice; requires demonstration of the completed project and a formal engineering report. Senior standing required. Corequisite: 55:85.

55:91 Professional Seminar: Electrical Engineering **0 s.h.**
Professional aspects of electrical engineering presented through lectures and discussions by guest speakers, field trips, films, and panel discussions on topics of current interest. May be repeated. Junior standing required.

55:98 Individual Investigations: Electrical Engineering **arr.**
Individual projects for electrical engineering undergraduate students: laboratory study, engineering design project, analysis and simulation of an engineering system, computer software development, research. Consent of supervising faculty adviser required.

Digital Systems and Computers

55:32 Introduction to Digital Design **3 s.h.**
Modern design and analysis of digital switching circuits; combinational logic; sequential circuits and system controllers; interfacing and busing techniques; design methodologies using medium- and large-scale integrated circuits; lab arranged. Prerequisites: 57:18, and 57:17 or 22C:18.

55:33 Introduction to Software Design **3 s.h.**
Design of software for microprocessor-based engineering systems; cross-development environment; algorithm design and structured programming; data structures; interfacing of high-level and low-level languages; device drivers; example applications to engineering problems; lab arranged. Prerequisite: 57:17.

55:35 Computer Architecture and Organization **3 s.h.**
Basic concepts of computer architecture and organization; computer evolution, register transfer level design, simulation techniques, instruction sets (CISC and RISC), ALU design, arithmetic algorithms, realization of arithmetic functions, hardwired and microprogrammed control, memory hierarchies, virtual memory, cache memory, interrupts and DMA, input/output; some advanced topics; students design and simulate a simple processor. Prerequisites: 55:32 and 55:33.

55:130 Switching Theory **3 s.h.**
Switching algebras; lattices; functional decomposition; symmetric functions; threshold logic; multiple-valued logic; combinational circuits—hazards, minimization, multiple-output networks; sequential circuits—critical races, essential hazards, fundamental-mode, pulse-mode, state reduction; fault-testing—path sensitizing, boolean difference, multiple-faults. Prerequisite: 55:32 or 22C:31.

55:131 Introduction to VLSI Design **3 s.h.**
MOS devices and circuits; introduction to CAD tools; MOS transistor theory, MOS processing technologies, MOS device models; timing and power considerations; performance issues; scaling; various logic schemes; circuit techniques; clocking strategies; I/O structures; design styles; MOS subsystem design; system case studies, introduction to high-speed digital circuits, design projects; lab. Prerequisites: 55:32 and 55:40.

55:132 High Performance Computer Architecture **3 s.h.**
Problems involved in designing and analyzing current high-performance computer architectures; hierarchical memory design, pipeline processing, vector machines, numerical applications, multiprocessor architectures and parallel algorithm design techniques; methods to evaluate performance of advanced computer systems and their use in determining the relation between computer design and design goals. Prerequisite: 55:35 and programming experience.

55:134 Computer Communications **3 s.h.**
Computer networks, ISO model, network topology, communication of digital data, data link control; errors and error control; point-to-point networks; broadcast networks, local network architecture; transport services; internetworking; user services. Prerequisites: senior standing in electrical and computer engineering or computer science; 22S:39 or 22S:120 or equivalent. Same as 22C:178.

55:135 Computer Graphics Systems **3 s.h.**
Design of vector and raster graphics hardware; three-dimensional transformations for viewing, clipping, and geometry; projective transformations; scan conversion, shading, bump and texture mapping; hidden surface and shadow algorithms; applications to engineering problems; lab. Prerequisite: 55:33.

55:136 Advanced VLSI Design **3 s.h.**
First and higher order models of transistors, models of interconnects, evaluation of circuit performance, circuit optimization, GaAs and ECL digital integrated circuits, ASIC design, practical problems of CMOS VLSI, small geometry MOS transistors and interconnects, VLSI models, algorithm design for VLSI; lab. Prerequisite: 55:131.

55:137 Microcomputer-Based Systems **3 s.h.**
Design; real-time system design, man-machine interfacing, integer arithmetics for floating point numbers and scaling, time sharing and multiprogramming with priority interrupt; laboratory projects. Prerequisites: 55:40, and 55:32 or 22C:31.

55:138 Testing Digital Logic Circuits **3 s.h.**
Logic models for faults; fault detection in combinational and sequential circuits; fault-diagnosis; design for testability; random testing, compressed data testing, built-in testing. Prerequisites: 55:32 and 55:40.

55:139 Design Automation of Digital Systems **3 s.h.**
Introduction to design automation, design representations, physical design methods, IC fabrication, design rules, partitioning of electrical circuits: two-point and multipoint nets, placement in one and two dimensions, global routing and detailed routing, specialized routing, symbolic layout and compaction, module generation and silicon compilation, synthesis, logic and timing simulation; design projects. Prerequisites: 55:32 and 55:33 or equivalent.

55:230 Advanced Switching Theory **3 s.h.**
Logically complete sets of primitives; synthesis; switch-level design procedures; arrays; partitioning; time and space complexity; current topics. Prerequisite: 55:130.

55:232 Advanced Computer Organization **3 s.h.**
Current research topics in computer architecture and organization; data flow, RISC, and parallel architectures; fifth-generation computers; associative processors, systolic architectures, and database machines; non-Von Neumann computation. Prerequisites: 55:130 and 55:132.

55:234 Distributed Computing **3 s.h.**
Fundamental problems in the design, implementation, and use of distributed computing systems; hardware topology issues, interprocess communication, concurrency control, and synchronization; distributed algorithms; fault-tolerance and reliability. Prerequisites: 55:132 and 55:134.

Signal Processing

55:40 Electronic Circuits **3 s.h.**
Design and analysis of FET and BJT amplifiers; low, midrange, and high-frequency analysis; difference amplifiers; feedback amplifiers; SPICE simulation; power amplifiers; digital logic families. Prerequisites: 57:12 and 57:18.

55:42 Signals and Systems **3 s.h.**
Representation and analysis of continuous and discrete-time systems; analysis in both time and frequency domains; Fourier analysis; sampling theory; z-transforms. Prerequisites: 57:12 and 22M:41.

55:141 Power Electronics **3 s.h.**
Conversion, regulation, and control of electric power by means of electronic switching devices; emphasis on switching techniques as they relate to efficiency; semiconductor switching devices; pulse-width modulation; analytical techniques and practical considerations. Prerequisites: 55:40 and 55:60.

55:143 Linear Integrated Electronics **3 s.h.**
Advanced topics in linear integrated circuits; active load concepts, noise models; analog voltage multipliers, phase-locked loops; case studies of op amps and regulators; MOS amplifier design. Prerequisite: 55:40.

55:144 Digital Integrated Electronics **3 s.h.**
Principles of operation of digital integrated circuits; logic families; use of four-state transistor models; sources of propagation delay; advanced design concepts; SPICE modeling; transmission line effects. Prerequisite: 55:40.

55:146 Digital Signal Processing **3 s.h.**
Theory and techniques used in representing discrete-time signals; system concepts in the frequency and sampling domains; FIR and IIR digital filter theory, design and realization techniques; theory and application of discrete Fourier transforms. Prerequisite: 55:42.

55:148 Digital Image Processing **3 s.h.**
Mathematical foundations and practical techniques for digital manipulation of images; image sampling, compression, enhancement, linear and nonlinear filtering and restoration; Fourier domain analysis, scene analysis, feature extraction; projects using minicomputer image processing system; lab. Prerequisite: 55:42.

55:242 Advanced Digital Signal Processing **3 s.h.**
Computer-aided design of digital filters, discrete Hilbert transform, effects of finite register length, homomorphic signal processing, power spectrum estimation, introduction to multidimensional signal processing, some current topics. Prerequisites: 55:146, 55:163, and 22M:118.

55:244 Theory of Adaptive Systems **3 s.h.**
Adaptive identification and filterings, Wiener filters, linear prediction, LMS algorithm, RLS algorithm; adaptive lattice filters; adaptive controls; recent advances in adaptive systems. Prerequisites: 55:146, 55:163, and 55:164.

Communications

55:50 Communication Systems 3 s.h.
Fourier transforms review and Hilbert transforms; narrow band signals and bandpass filters; amplitude and angle modulation systems; random processes, stationarity, and ergodicity; noise, noise figure, and noise analysis of CW systems; pulse analog modulation. Prerequisites: 55:42 and 22S:39.

55:150 Communication Theory 3 s.h.
Spectral analysis, random signals and noise; baseband data transmission; digital modulation techniques; performance analysis of amplitude, angle, and digital systems; optimal receivers for Gaussian noise, coding for error detection and correction. Prerequisite: 55:50.

55:151 Statistical Communication Theory 3 s.h.
Representation of signals and random processes; elementary detection and estimation theory; detection of known and unknown signals in noise; estimation of continuous waveforms; applications to speech processing, communications, and radar. Prerequisite: 55:150.

55:152 Introduction to Information and Coding Theories 3 s.h.
Quantitative measure of information; discrete and continuous sources; source encoding; error detecting codes; discrete and continuous channels; block and convolutional codes. Prerequisite: 55:50.

Controls

55:60 Control Systems 3 s.h.
Introduction to linear feedback control systems; transfer functions; time and frequency domain analysis of system characteristics and stability; lab arranged. Prerequisite: 55:42.

55:66 Electromechanical Systems 3 s.h.
Electromechanical energy conversion principles; basic rotating machines; direct-current machines—theory and applications; alternating-current machines—theory and applications. Prerequisites: 57:12 and 55:70.

55:68 Power Systems Analysis 3 s.h.
AC fundamentals; transmission lines; power system representation, load-flow, and stability studies; economic operation; faults; symmetrical components. Prerequisite: 57:12.

55:160 Control Theory 3 s.h.
Introduction to the state space approach; controllability, observability, canonical forms; Luenberger observers; feedback control via pole placement; stability, minimal realization; advanced topics. Prerequisite: 55:60 or 58:131. Same as 58:133.

55:161 Control System Design 3 s.h.
Design techniques for linear control systems; state feedback and classical compensation methods; emphasis on physical system behavior. Prerequisite: 58:131 or equivalent. Same as 58:132.

55:163 Random Processes in Control and Communications 3 s.h.
Basic concepts of probability and random variables; sequences of random variables; the multivariate Gaussian distribution; random processes; spectral analysis; analysis of random processes in linear systems; Markov, Gaussian, and Poisson processes, applications to system analysis. Prerequisites: 55:50 and 55:60.

55:164 Computer-Based Control Systems 3 s.h.
Introduction to discrete and digital control systems; application of computers in control; sampling theorem; discrete time system models; analysis and design of discrete time systems; control design by state variable and input/output methods; advanced topics in digital controls; lab. Prerequisite: 55:60 or 58:131. Same as 58:134.

55:165 Introduction to Robotics 3 s.h.
Introduction to robotics; coordinate transformation; kinematics and inverse kinematics; manipulator dynamics; trajectory planning; manipulator control; force and compliance control; robot programming languages; laboratory projects. Prerequisite: 55:60.

55:262 Stochastic Control Systems 3 s.h.
Modeling of controlled stochastic systems; complete and partial information dynamic programming; separation of estimation and control; Kalman filtering; infinite horizon dynamic programming; system identification; stochastic adaptive control. Prerequisites: 55:160 or 55:164, and 55:163.

55:264 Nonlinear Stability 3 s.h.
Concepts of different types of stability; Lasalle's theorem; Lyapunov's methods; periodic systems; slowly time varying systems; the linearization principle; Popov's criterion; the Circle Criterion; Discrete Time Systems; the Contraction Principle. Prerequisites: 55:160 and 55:164.

55:266 Advanced Control Theory 3 s.h.
Optimal control, tracking control, state reconstruction, nonlinear systems, linearization, describing function, optimal filtering. Prerequisite: 55:160. Same as 58:231.

Waves and Materials

55:70 Electromagnetic Theory 3 s.h.
Electric and magnetic forces, Maxwell's equations, wave propagation; applications, including radiation, transmission lines, and circuit theory. Prerequisites: 22M:42 and 29:18.

55:72 Electrical Engineering Materials and Devices 3 s.h.
Introduction to fundamental electrical properties of semiconductor devices and plasma physics. Prerequisites: 29:18 and 55:40.

55:170 Advanced Electromagnetic Theory 3 s.h.
Time varying fields; plane wave propagation, reflection, and refraction; transmission lines, the Smith chart, the scattering matrix, coupled modes; metallic and dielectric wave guides; microwave resonators; antennas and antenna arrays. Prerequisite: 55:70.

55:171 Linear and Non-Linear Waves 3 s.h.
Introduction to wave phenomena, basic properties of waves; sound; surface, mechanical, water, and electromagnetic waves; nonlinear shocks and solitons. Senior standing required.

55:172 Solid State Physical Electronics 3 s.h.
Introduction to semiconductor physics, semiconducting devices; elementary quantum mechanics and statistics; transport; bipolar and MOS transistors; physics of device operation as it relates to circuit design. Prerequisites: 55:72 and 29:83.

55:178 Optical Signal Processing 3 s.h.
Linear systems description of optical propagation; diffraction and angular plane wave spectrum; lenses as Fourier transformers, lens configurations as generalized optical processors; lasers, coherence, spatial frequency analysis; holography; convolvers, correlators, matched filters; synthetic aperture radar; optical computing. Prerequisite: 55:42 or 55:70 or 29:130.

55:179 Electro-Optics 3 s.h.
Wave equation solutions; optical birefringence; finite beam propagation in free space, dielectric waveguides and fibers; optical resonators; nonlinear phenomena; electro-optic and acousto-optic modulation; optical detection and noise; application to communication systems. Prerequisite: 55:70.

55:272 Quantum Electronics 3 s.h.
Fundamentals including field and particle quantization, interaction of EM and acoustic fields with matter, noise statistics, single- and multiple-photon processes, nonlinear optics, and losses in quantum electronics systems. Prerequisites: 55:172 and 29:116.

55:278 Advanced Optical Signal Processing 3 s.h.
Review of two-dimensional systems, optical Fourier transformation, holography, optical spatial filtering, correlation, and convolution; matched filtering and optical pattern recognition; acousto-optic cells and signal processing; incoherent optical processing; spatial light modulators and hybrid optical signal processing systems; associative processors based hybrid matrix-vector multipliers; optical neural processors; bistable optical gates and all-optical computing. Prerequisite: 55:178.

Graduate Seminars, Advanced Topics, Research

55:191 Graduate Seminar: Electrical and Computer Engineering 0 s.h.
Presentation and discussion of recent advances and research in electrical and computer engineering by guest lecturers, faculty, and students. Graduate standing required.

55:195 Contemporary Topics in Electrical and Computer Engineering arr.
New topics or areas of study not offered in other electrical and computer engineering courses; based on faculty/student interest; not available for individual study. Senior standing required.

55:198 Individual Investigations: Electrical and Computer Engineering arr.
Individual projects for electrical and computer engineering graduate students; laboratory study, engineering design project, analysis and simulation of an engineering system, computer software development, and research. Graduate standing and consent of faculty adviser required.

55:199 Research: Electrical and Computer Engineering, M.S. Thesis arr.
Experimental and/or analytical investigation of an approved topic for partial fulfillment of the requirements for the M.S. degree with thesis in electrical and computer engineering. Graduate standing and consent of faculty adviser required.

55:291 Seminar: Plasma Physics arr.
Discussion of current research. Consent of instructor required. Same as 29:261.

55:295 Advanced Topics in Electrical and Computer Engineering arr.
Discussion of current literature in electrical and computer engineering. Consent of instructor required.

55:299 Research: Electrical and Computer Engineering, Ph.D. Thesis arr.
Experimental and/or analytical investigation of an approved topic for partial fulfillment of the requirements for the Ph.D. degree in electrical and computer engineering. Consent of faculty adviser required.

INDUSTRIAL ENGINEERING

Chair: Andrew Kusiak
Professors: James R. Buck, Andrew Kusiak, John M. Liittschwager, J. Richard Simon
Professor emeritus: J. Wayne Deegan
Associate professors: Dennis L. Bricker, Gary W. Fischer, Joe Pignatiello
Associate professor emeritus: Edward M. Mielnik
Undergraduate degree offered: B.S.E. in Industrial Engineering
Graduate degrees offered: M.S., Ph.D. in Industrial Engineering

Industrial engineering is concerned with analysis, design, and implementation of systems through optimal use of resources—human, material, energy, information, and financial. Systems may range from small subsystems to extremely large operations. In order to accomplish these activities, the industrial engineer must be skilled in mathematics, physical sciences, management, and human relations as well as computer systems, economics, optimization, human behavior, and systems analysis and design. Undergraduate programs are planned to provide courses on these topics and to provide some opportunity to specialize in specific areas based on individual student interests.

Industrial engineers have many opportunities for employment and service in industrial, government, research, and public service organizations. Employment opportunities are among the most varied in the engineering field. Industrial engineers hold positions as advisers to management or may participate directly in management decisions. Representative job titles include industrial engineer, systems analyst, quality specialist, operations research analyst, internal consultant, human factors specialist, supervisor, and manager. While most industrial engineers are employed by manufacturing firms, others work in

government agencies or service organizations such as airlines, banks, and hospitals.

Undergraduate Program

The undergraduate curriculum in industrial engineering requires a strong foundation of courses in engineering science, mathematics, design, social sciences, and humanities. Advanced courses include specialty courses in manufacturing operations and robotics, human factors (ergonomics), management, economics and information systems, production, quality control, and operations research.

Industrial Engineering Curriculum

Freshman Year

First Semester

4:13 Principles of Chemistry I	3 s.h.
Rhetoric (10:2 or 10:3)	4 s.h.
22M:35 Engineering Calculus I	4 s.h.
57:5 Engineering I	3 s.h.
Humanities elective (see below)	3 s.h.
Total	17 s.h.

Second Semester

4:16 Principles of Chemistry Laboratory I	2 s.h.
22M:36 Engineering Calculus II	4 s.h.
22M:40 Matrix Algebra for Engineers	2 s.h.
29:17 Introductory Physics I	4 s.h.
57:6 Engineering II	3 s.h.
Total	15 s.h.

Sophomore Year

First Semester

22M:41 Differential Equations for Engineers	3 s.h.
29:18 Introductory Physics II	4 s.h.
57:7 Statics	2 s.h.
57:9 Thermodynamics I	3 s.h.
57:14 Engineering Economy	3 s.h.
Total	15 s.h.

Second Semester

22S:39 Probability and Statistics for the Engineering and Physical Sciences	3 s.h.
31:3 General Psychology (social science elective)	4 s.h.
57:8 Electrical Circuits	3 s.h.
57:15 Materials Science	3 s.h.
Economics elective (see below)	3 s.h.
Total	16 s.h.

Junior Year

First Semester

56:31 Manufacturing Processes	3 s.h.
56:142 Human Factors Engineering	3 s.h.
57:17 Computers in Engineering	3 s.h.
57:21 Principles of Design I	3 s.h.
Mathematics-statistics elective (see below)	3 s.h.
Engineering science elective (see below)	3 s.h.
Total	18 s.h.

Second Semester

56:91 Professional Seminar: Industrial Engineering	0 s.h.
56:131 Manufacturing Systems	3 s.h.
56:140 Design of Work Methods	3 s.h.
57:22 Principles of Design II	3 s.h.
56:171 Operations Research	3 s.h.
Technical elective (see below)	3 s.h.
Total	15 s.h.

Senior Year

First Semester

31:156 Psychology in Management (social science elective)	3 s.h.
56:91 Professional Seminar: Industrial Engineering	1 s.h.
56:150 Information Systems Design	3 s.h.
56:166 Production Systems	3 s.h.
Technical elective (see below)	3 s.h.
Total	16 s.h.

Second Semester

56:91 Professional Seminar: Industrial Engineering	0 s.h.
56:160 Operational Systems Design	4 s.h.
56:162 Quality Control and Engineering Statistics	3 s.h.
Humanities elective (100 level)	3 s.h.
Technical electives (see below)	6 s.h.
Total	16 s.h.

Economics Electives

Students may select from the following:

6E:100 Price, Employment, and Production Theory	3 s.h.
6E:103 Microeconomics	3 s.h.
6E:111 Labor Economics	3 s.h.
6K:173 Managerial Economics	3 s.h.

Humanities and Social Science Electives

These must be selected to satisfy the College of Engineering requirements. Noted social science electives are highly recommended. An advising guide for humanities sequences may be obtained from the office of the dean.

Mathematics and Statistics Electives

Students may select from the following:

22M:42 Vector Calculus for Engineers	3 s.h.
22M:72 Elementary Numerical Analysis	3 s.h.
Advanced statistics course (with adviser's approval)	3 s.h.

Engineering Science Electives

Students may select one of these:

57:10 Dynamics	3 s.h.
57:12 Linear Systems Analysis	3 s.h.
57:13 Engineering Biological Sciences	3 s.h.
57:18 Principles of Electronic Instrumentation	4 s.h.
57:19 Mechanics of Deformable Bodies	3 s.h.
57:20 Mechanics of Fluids and Transfer Processes	4 s.h.

Technical Electives

Students may select 12 semester hours from the list below, plus 3 semester hours with consent of adviser; or 9 semester hours from the list below plus 3 semester hours from the engineering science core elective and 3 semester hours with consent of adviser.

56:98 Individual Investigations: Industrial Engineering	3 s.h.
56:132 Introduction to Industrial Robotics	3 s.h.
56:138 Artificial Intelligence in Manufacturing I	3 s.h.
56:143 Advanced Human Factors Engineering	3 s.h.
56:146 Advanced Managerial Psychology	3 s.h.
56:151 Microcomputer Applications	3 s.h.
56:153 Engineering Administration I	3 s.h.
56:155 Quantitative Investment Analysis	3 s.h.
56:156 Engineering Economic Decisions	3 s.h.
56:163 Quality Engineering I	3 s.h.
56:164 Reliability Theory and Practice	3 s.h.
56:176 Regression Analysis	3 s.h.
56:178 Digital Systems Simulation	3 s.h.
56:195 Contemporary Topics in Industrial Engineering	3 s.h.

Specialization in Quality Engineering

Quality engineering is the specialization in the engineering profession that is concerned with the design, manufacture, delivery, maintenance, and use of products and services over their life cycles. Since quality is the fitness of these products or services to meet customer needs, engineers must identify and improve quality throughout all phases of the product's or service's creation and use. Quality has an economic dimension in those costs that occur after, as well as during the design, development, and manufacture of products and services.

The background requirements of quality engineering are similar to those of industrial engineering. Consequently, a specialization in quality engineering can be obtained through the judicious selection of elective courses in the industrial engineering program. For the quality engineering specialization, 12 semester hours are required from the following list.

56:153 Engineering Administration I	3 s.h.
56:163 Quality Engineering I	3 s.h.
56:164 Reliability Theory and Practice	3 s.h.
56:176 Regression Analysis	3 s.h.

22S:158 Analysis and Design of Experiments I 3 s.h.

These courses replace 12 semester hours of technical elective requirements of the industrial engineering program. Students who meet the requirements of the quality engineering specialization receive certificates noting this emphasis in conjunction with their B.S.E. degree in industrial engineering.

Graduate Programs

Graduate programs in industrial engineering are tailored to meet the needs of the individual. Each student's program of study is based on his or her background, career objectives, and sound academic practice. The curriculum is highly flexible; the goal is academic excellence.

There are five principal areas of academic focus in the graduate program in industrial engineering: manufacturing, human factors engineering/ergonomics, information and engineering management, quality and production control, and operations research and applied statistics.

Manufacturing courses, denoted by the 30 series, delve into selecting appropriate manufacturing materials, planning processing operations, devising control strategies, and designing products and manufacturing systems. Contemporary topics in computer-aided planning and design, computer-controlled manufacturing and applications of artificial intelligence in manufacturing are covered.

Human factors studies concentrate on applying the psychological, physiological, and sociological sciences to problems in manufacturing and service systems. These problems concern fitting jobs and organizations to the people who perform those jobs within the organization as well as managing and motivating those people. Courses in the 40 series cover these topics.

Information and engineering management studies concentrate on computerized information systems, and the design of supporting software. Other topics include engineering administration and engineering economics. This area is covered by courses in the 50 series.

The quality and production control area consists of facilities design, quality assurance, reliability, and production control. This area of concentration is covered by courses in the 60 series.

Studies in operations research and applied statistics concentrate on mathematical, statistical, and computer sciences for modeling, analyzing, and optimizing systems. Various methodologies in this area include mathematical programming, heuristic optimization, statistical analysis, and digital systems simulation. Courses in the 70 series cover these topics.

Most graduate students tend to focus on one of these specialty areas, while others distribute their studies over more than one area.

Students in the graduate program participate in research in the areas of their academic concentration. Ongoing manufacturing research consists of flexible manufacturing systems, design, optimum control of processing paths, adaptive manufacturing control, parametric robotic control, and automatic pattern recognition of parts. Current research in human factors engineering/ergonomics consists of investigating the effects of visual and auditory information on human information processing, performance time statistics with cognitive tasks, and the effects of aging on human performance. Other ergonomic research is directed to the use of digital simulation to solve human workload problems, industrial inspection, computer-aided human problem solving, and techniques of ergonomic data collection and analysis.

Some current research in information and engineering management consists of information economics, entrepreneurship, governmental redistricting, parametric cash flow analysis, strategic management, and economic risk analysis. Quality and production control research is currently focused on computer-aided layout and scheduling, materials handling systems, location and allocation of automatic inspection, on-line expert systems in process control, and inventory record accuracy-assurance procedures.

Ongoing research in operations research and applied statistics is centered on optimization, expert systems in scheduling and dispatching, simulation and random number generation, and the development of programming techniques for classification problems. Other research is directed toward extending the capabilities of computer graphics.

Master of Science

Two M.S. programs are available: thesis and nonthesis. Students considering eventual admission to a Ph.D. program should select the thesis option. It requires a minimum of 30 semester hours of 100- or 200-level courses, including a maximum of 8 semester hours of research. Students who elect the nonthesis option must complete a minimum of 36 semester hours of course work at the 100 or 200 level, including at least 9 semester hours at either the 200 level or at the 100 level with the designation "advanced" or "contemporary topics" in the course title.

Each student develops a tentative plan of study through consultation with his or her adviser; the final plan of study is reviewed by the student's examining committee and approved by the industrial engineering program chair and the Graduate College dean.

Entering students in all programs need a background in computer programming, probability, statistics, and mathematics equivalent to that required in accredited undergraduate engineering programs. Both verbal and written skills in the English language are essential. Engineering management and human factors students will find psychology and engineering economics to be useful preparation. Compensatory course work may be required for students with nonengineering backgrounds.

Students are required to maintain a minimum grade-point average of 3.00 on all graduate course work (both 100- and 200-level courses) at The University of Iowa in order to be eligible for the M.S. degree. The nature of the final examination is specified by the examining committee. It may consist of both written and oral parts. The examination explores students' course preparation and/or an appropriate individual investigation.

Doctor of Philosophy

Typically, Ph.D. programs in industrial engineering require at least 72 semester hours of study, including research for the dissertation.

Actual study requirements above this minimum are specified by the student's advisory committee. There is no foreign language requirement or special requirement for research techniques. Admission to degree candidacy requires a minimum grade-point average of 3.25 on all graduate work taken at The University of Iowa and the demonstration of a capacity for individual achievement.

Upon completing the course work specified by their adviser and advisory committee, students are admitted to the comprehensive examination, which includes both written and oral parts. Part of this examination usually includes the presentation of a dissertation proposal, so that the advisory committee can evaluate the student's academic preparation in light of the research to be performed. Upon satisfactorily completing this examination, students are accepted as candidates for the Ph.D. and usually have only to complete and defend their dissertation.

Part-time Ph.D. study is discouraged.

Admission

Students with an M.S. objective may be admitted from an ABET-accredited baccalaureate curriculum in any engineering discipline or in the mathematical or physical sciences with a minimum grade-point average of 2.75 and/or an acceptable score on the Graduate Record Examination (GRE) General Test (typically at least 400 verbal, 650 quantitative). Applicants from non-U.S. institutions must meet equivalent conditions for regular admission. Students may be considered for conditional admission with a lower grade-point average and lesser GRE General Test scores.

Students from business or social science programs who have adequate mathematical preparation also may be considered for regular or conditional admission. Students on conditional status must achieve regular

status within two sessions of registration by attaining a grade-point average of at least 3.00 and gaining regular acceptance by the industrial engineering program faculty; otherwise, they are dismissed. Admissions may be limited by the number of faculty and other available resources.

Students with a Ph.D. objective may be admitted from an ABET-accredited baccalaureate or a postbaccalaureate curriculum in any engineering discipline or in the mathematical and physical sciences with a minimum grade-point average of 3.00 and/or an acceptable GRE General Test score (typically at least 500 verbal, 700 quantitative). Applicants from outside the United States must meet equivalent requirements for regular admission as determined by The University of Iowa. Students also may be admitted from business or social science programs as determined individually. Students who want to earn a Ph.D. and who have a B.S. degree or an M.S. degree without thesis usually are first admitted to the M.S. program. All admissions to the Ph.D. program are approved by the faculty as a committee of the whole.

Financial Aid

A number of one-quarter-time and one-half-time graduate student teaching and research assistantships are available. Awards are based on students' academic records and assessment of their potential contribution to the research and teaching goals of the program. Advanced graduate students also may qualify for higher stipend instructor positions. Students should write to the chair of the industrial engineering department for further information.

Special Facilities and Laboratories

Engineering Core

Information about laboratories affiliated with core courses coordinated by other departments can be found in the *Catalog* sections for each of the other engineering departments.

Required and Elective Course Laboratories

Industrial engineering occupies the north wing of the fourth floor in the Engineering Building. Most classes and seminars meet there. Faculty offices, graduate student offices, and several laboratories also are located there. The laboratories are described below.

Computer Integrated Systems Laboratory

This facility has equipment that supports instructional and research needs on production and manufacturing operations. Included are a variety of small-scale fixed and mobile robots; automatic vision and sensing devices; microcomputers of various types; a digital camera for computer pattern recognition; a television camera, recorder, and player; precision controller devices; programmable controllers; actuation devices; and reconfigurable construction units for modeling physical material handling systems.

Software is available for part geometry, generating computer numerical control (CNC) programs, computer process planning, expert systems, and for other general purposes.

Human Factors/Ergonomics Laboratory

This laboratory facilitates human factors/ergonomics research and education. It contains microcomputers and minicomputers with numerous peripherals for the real-time collection and analysis of human performance data as well as alternative forms of information displays and human response recorders.

Computer-Aided Manufacturing (CAM) Laboratory

This laboratory is used to teach CAD (computer-aided design) and CAM programming and to set up projects to demonstrate various computer-integrated manufacturing technologies. Hardware and software are available to design parts and plan processing, including generation of CNC program files.

Typical activities conducted in the laboratory include geometric modeling; transfer of geometric files and other design data to conduct process-planning experiments; assignment of part codes and identification of the most cost-effective machine assignments for the part processing; definition of the operation sequences and calculation of optimal process settings; generation of CNC part programs and support data; and down load of appropriate machining instructions and data to preset CNC machines (small-scale or full-scale) to make the parts. Laboratory equipment includes IBM, Macintosh, and Apple IIe microcomputers; small-scale machine tools (milling and turning); and different types of industrial controls.

Computer Numerical Control (CNC) Machining Laboratory

Students gain hands-on experience in programming and operating a CNC lathe and an automated storage and retrieval system in this laboratory. CNC programs can be developed through the machine control keyboard or down loaded via RS232C data link from a programming station in the CAM Laboratory. Research studies in the machinability of various metals for different cutting tool and machining parameters are planned.

Future additions to the laboratory include the purchase of a full-size CNC milling machine and additional test, measurement, and recording equipment to interface with the machine tools.

Manufacturing Processes Laboratory

This laboratory provides improved facilities and equipment for automated arc welding and conventional metal working processes. Gas metal arc welding (GMAW or MIG) systems are used in undergraduate courses to demonstrate process control issues, and in research to investigate process relationships during high-speed welding. A full-size welding robot fabrication cell also is planned for the laboratory to facilitate further investigation of the weld process variable control problem and analytically based, off-line programming techniques.

Intelligent Systems Laboratory

APOLLO work stations, IBM PC and Macintosh IIci microcomputers with extended disc and operating memory are housed in this laboratory. Software for design and building intelligent systems is available, including expert system shells (VP Expert, NExpert), logic programming languages (LISP, PROLOG), intelligent CAD design software (Ashlar-Vellum), simulation software (SLAM, TESS), a voice recognition system, and specialized programs for design of products and systems.

Courses

Special

56:000 Cooperative Education Training Assignment: Industrial Engineering **0 s.h.**
Industrial engineering students participating in the Cooperative Education Program register in this course during work assignment periods; registration provides a record of participation in the program on the student's permanent record. Consent of faculty adviser required. Admission to the Cooperative Education Program required.

56:91 Professional Seminar: Industrial Engineering **0-1 s.h.**
Professional aspects of industrial engineering presented through lectures and discussions by guest speakers, field trips, films, and panel discussions on topics of current interest. May be repeated. Junior standing required.

56:98 Individual Investigations: Industrial Engineering **arr.**
Independent projects in industrial engineering for undergraduate students: laboratory study, engineering design project, analysis and simulation of an engineering system, computer software development, and research. Consent of course adviser required.

Manufacturing

56:31 Manufacturing Processes **3 s.h.**
Fundamentals of processing typical industrial materials including casting, heat treating, welding, machining, numerical control forming, and finishing; automation, economics, and design considerations, planning of manufacturing operations, and performance measurement; laboratory exercises and projects. Offered fall semesters. Prerequisite: 57:15.

56:131 Manufacturing Systems **3 s.h.**
An overview of manufacturing as systems consisting of computer and microprocessor controls; technical and economic tradeoffs regarding the design, selection, and implementation of various degrees of computer aiding in manufacturing systems; computer numerical control (CNC) machining, automated material handling, automated assembly, flexible manufacturing systems. Offered spring semesters. Prerequisites: 56:31 and 57:21, or consent of instructor.

56:132 Introduction to Industrial Robotics **3 s.h.**
Operation and control of robot systems; robotic sensors and data acquisition subsystems; machine vision; software for robot control; design of robotic workcells; laboratory projects required. Corequisite: 56:150.

56:138 Artificial Intelligence in Manufacturing I 3 s.h.
Search techniques, components of knowledge-based systems, design of knowledge bases and inferencing; application of knowledge-based systems in design of products, processes, systems and machine diagnostics, production planning and scheduling. Prerequisites: 57:21 and 56:171.

56:231 Computer-Integrated Manufacturing 3 s.h.
Design and operational issues related to the integration of computers in manufacturing systems; theoretical and applied topics. Prerequisite: 56:131 or consent of instructor.

56:238 Artificial Intelligence in Manufacturing II 3 s.h.
Neural networks, knowledge acquisition and verification techniques, and concept learning; applications of artificial intelligence in concurrent engineering. Prerequisite: 56:138 or consent of instructor.

Human Factors/Ergonomics

56:140 Design of Work Methods 3 s.h.
Procedures of analysis and design required to integrate humans into productive systems; emphasis on human performance measurements and on methods design; laboratory, projects. Offered spring semesters. Prerequisites: 56:142, and 22S:39 or 22S:120.

56:142 Human Factors Engineering 3 s.h.
Design of operator-machine systems and development of optimum work environment through principles of behavioral science; emphasis on sensory and perceptual processes, motor skills, experimental methodology. Offered fall semesters. Prerequisite: 31:1 or 31:3. Same as 31:155.

56:143 Advanced Human Factors Engineering/Ergonomics 3 s.h.
Theory of signal detectability, information theory, behavioral decision theory, studies of perception and reaction time, human reliability, process control, problem solving. Offered spring semesters. Prerequisites: 56:140 and 56:142, or consent of instructor.

56:145 Psychology in Management 3 s.h.
Application of psychological principles to human relations and supervision; motivation, leadership, communication, group pressures. Offered fall semesters. Same as 31:156.

56:146 Advanced Managerial Psychology 3 s.h.
Selected recent literature on managerial psychology. Offered spring semesters. Prerequisite: 56:145.

Information and Engineering Management

56:150 Information Systems Design 3 s.h.
Structure and design of computer-based information systems; concepts of information, systems, and decision making; computer hardware, software, and data structures; methods for determining system requirements; designing, implementing, evaluating, and managing information systems; applied projects. Prerequisite: 56:140.

56:151 Microcomputer Applications 3 s.h.
Programming and interfacing microcomputers for industrial applications; essentials of microprocessor hardware, software, and peripherals; algorithms, interface circuits, and software for applications such as process control, machine control, robot systems, product testing, materials handling, and decision support; laboratory projects; primarily for senior and graduate industrial engineering students. Prerequisite: 57:18 or consent of instructor.

56:153 Engineering Administration I 3 s.h.
Studies in engineering management; methods for organizing, planning, funding, and controlling engineering efforts; nature of the engineering and management function. Prerequisite: economics elective.

56:155 Quantitative Investment Analysis 3 s.h.
Investment criteria; benefits/cash-flow analysis; risk analysis; applications in production and quality planning; facilities-equipment acquisition and replacement; research, development, and design; capital budgeting. Offered fall semesters of odd years. Prerequisites: 57:14, and 22S:39 or 22S:120; or consent of instructor.

56:156 Engineering Economic Decisions 3 s.h.
Risky decisions in design and management applications, decision rules, utility theory, Bayesian analysis and information, conjugate distributions, decision strategies, and multicriteria objectives. Offered fall semesters of even years. Prerequisites: 57:14, and 22S:39 or 22S:120; or consent of instructor.

56:250 Software Systems for Engineering Applications 3 s.h.
Design and implementation of computer-based systems relating to management and engineering problems; principles and practices in the development of computer software systems, application and use of data structures in software design, current topics in the field; design project required. Offered spring semesters of even years. Prerequisite: 56:150 or consent of instructor.

56:253 Engineering Administration II 3 s.h.
Continuation of 56:153; readings that emphasize practices in superior and high technology organizations. Prerequisite: 56:153 or consent of instructor.

Quality and Production Control

56:160 Operational Systems Design 4 s.h.
Projects involving the design of products and related operational systems in an industrial or service organization, including associated entrepreneurial or intrapreneurial planning. Offered spring semesters. Prerequisite: 56:150.

56:162 Quality Control and Engineering Statistics 3 s.h.
Basic techniques of statistical quality control for process control and acceptance sampling; design and application of control charts for attributes and variables; design of inspection plans for lot-by-lot and continuous production; economic and management aspects of quality assurance systems. Offered spring semesters. Prerequisite: 22S:39. Same as 22S:133.

56:163 Quality Engineering I 3 s.h.
Engineering techniques for designing quality into manufactured products and processes; design and analysis of multifactor experiments, economics of reducing variations, critique of Taguchi methods. Corequisite: 56:162 or consent of instructor.

56:164 Reliability Theory and Practice 3 s.h.
Theory and models relating to the life of components and repairable systems: common distributions and hazard functions; analysis methods for complex systems; renewal and repair theory; related parameter estimation. Prerequisite: 56:162.

56:166 Production Systems 3 s.h.
Study of mathematical models for design and operations of manufacturing systems; equipment selection, machine layout, group technology, process planning, production planning and scheduling, just-in-time concepts, concurrent engineering, introduction to knowledge-based systems. Prerequisite: 56:171.

56:263 Quality Engineering II 3 s.h.
Continuation of 56:163, which is prerequisite; signal-to-noise ratios and other data transformations; empirical model building and response surface methods for quality engineering; combined-array and product-array techniques for optimizing quality.

56:266 Production-Inventory Models 3 s.h.
Optimal and heuristic mathematical models for economic lot scheduling, dynamic lot sizing, aggregate planning, and multistage scheduling; network analysis. Prerequisite: 56:166 or equivalent.

Operations Research and Applied Statistics

56:171 Operations Research 3 s.h.
Operations research models and applications emphasizing both deterministic and probabilistic models: linear programming, duality, parametric analysis, dynamic programming, queueing theory, games, and decision theory. Offered spring semesters. Prerequisites: 57:21 and 22S:39.

56:176 Regression Analysis 3 s.h.
Analysis of the multiple linear regression model, matrix approach, residual analysis, variable selection, dummy variables, regression diagnostics, and use of statistical computer packages. Prerequisite: 22S:120 or equivalent. Same as 22S:152.

56:178 Digital Systems Simulation 3 s.h.
Digital simulation modeling and analysis; emphasis on construction of models and interpretation of model outputs; topics include discrete time modeling, continuous time modeling, network modeling, combined discrete-continuous-network modeling, the construction of model-related databases, and applications. Offered fall semesters. Prerequisite: 57:22 or graduate standing.

56:270 Linear Programming 3 s.h.
Study of mathematical models, theory, and algorithms for linear optimization, including variants of the simplex algorithm, duality theory, post-optimality analysis, decomposition of large-scale problems, and piece-wise linear programming. Offered spring semesters.

56:271 Nonlinear Programming 3 s.h.
Mathematical models, theory, and algorithms for constrained and unconstrained optimization; topics include nonlinear, geometric, quadratic, and dynamic programming; optimality conditions; aspects of duality theory; other current topics. Offered fall semesters.

56:272 Integer Programming and Network Flows 3 s.h.
Theory, applications, and algorithms for combinatorial optimization problems, including integer and mixed-integer mathematical programming problems as well as problems formulated in a network or graph setting, including routing of vehicles and location of facilities in networks.

56:273 Stochastic Systems 3 s.h.
Probabilistic operations research models and algorithms, emphasis on applications in manufacturing and production planning; random processes; Markov chains and applications; probabilistic dynamic programming; Markov decision problems; queueing models. Prerequisites: 56:171 and introductory course in probability models.

Graduate Seminars, Advanced Topics, Research

56:191 Graduate Seminar: Industrial Engineering 0 s.h.
Recent advances and research in industrial engineering presented by guest lecturers, faculty, and students. Graduate standing required.

56:195 Contemporary Topics in Industrial Engineering arr.
New topics or areas of study not offered in other industrial engineering courses; topics based on faculty/student interest. Senior standing required.

56:198 Individual Investigations: Industrial Engineering arr.
Individual projects for industrial engineering graduate students: laboratory study, engineering design, analysis and simulation of an engineering system, computer software development, or research. Graduate standing and consent of adviser required.

56:199 Research: Industrial Engineering, M.S. Thesis arr.
Experimental and/or analytical investigation of an approved topic for partial fulfillment of the requirements for the M.S. degree with thesis in industrial engineering. Graduate standing and consent of adviser required.

56:295 Advanced Topics in Industrial Engineering arr.
Discussion of current literature in industrial engineering. Consent of instructor required.

56:299 Research: Industrial Engineering, Ph.D. Dissertation arr.
Experimental and/or analytical investigation of an approved topic for partial fulfillment of the requirements for the Ph.D. degree in industrial engineering. Consent of adviser required.

MECHANICAL ENGINEERING

Chair: Ching-Jen Chen
Professors: James G. Andrews, Ching-Jen Chen, Kyung K. Choi, Allen T. Chwang, Edward J. Haug, Robert G. Hering, Philip G. Hubbard, George M. Lance, Virendra C. Patel, Paul D. Scholz, Theodore F. Smith, Ralph I. Stephens
Professors emeriti: Louis Landweber, Enzo O. Macagno, Donald H. Madsen, J. Merle Trummel
Associate professors: Barry Butler, Lea-Der

Chen, Fred Stern
Assistant professors: Christoph Beckermann, Sang S. Kim, J. Kirk Wu, K. Harold Yae
Undergraduate degree offered: B.S.E. in Mechanical Engineering
Graduate degrees offered: M.S., Ph.D. in Mechanical Engineering

Mechanical engineering is broadly concerned with energy, including its transformation from one form to another, its transmission, and its utilization. Mechanical engineers conceive, plan, design, and direct the manufacture, distribution, and operation of a wide variety of devices, machines, and systems—including complex man-machine systems—for energy conversion, environmental control, materials processing, transportation, materials handling, and other purposes. A description of the field includes thermal-fluids engineering and mechanical systems engineering.

Thermal-Fluids Engineering

Thermal-fluid phenomena occur in many engineering systems and devices, such as: aircraft; gas turbines; heat exchangers; material processes; heating, ventilating, airconditioning and refrigerating units; and biomedical systems. Work on these systems requires an interdisciplinary team in which the mechanical engineer is an important member.

Mechanical Systems

Mechanical systems and machines are the foundations of human technology. Examples of such systems and devices are manufacturing equipment, automobiles, tractors, ships, home appliances, packaging machinery, and aircraft.

Mechanical engineers find employment opportunities in a wide variety of jobs, including those in industry, government, and education. Mechanical engineers form an integral part of most industries, including aerospace firms, energy-generation utilities, automobile manufacturers, food- and metal-processing industries, petroleum refineries, electronic and computer manufacturers, heavy construction vehicle manufacturers, thermal comfort firms, and farm implement firms.

Undergraduate Program

The objective of the mechanical engineering program is to provide the student with a sound preparation for a career in the field. In addition to the specified courses in the curriculum, students choose social science, humanities, and technical elective courses in accordance with program guidelines. Upper-level students are required to work on group projects in a senior-level capstone design course, 58:86 Mechanical Engineering Project. Participation in established research projects may be arranged.

The undergraduate education of a mechanical engineer at The University of Iowa is based on four curriculum stems: mathematics and basic sciences; engineering sciences; engineering design; and humanities and social sciences. Mathematics, physics, and chemistry are considered to be basic disciplines on which a future mechanical engineer must build. Parallel to the mathematics and basic sciences are the engineering sciences: statics, dynamics, thermodynamics, mechanics of deformable bodies, mechanics of fluids and transfer processes, materials science, and electrical sciences. An understanding of these sciences enables a mechanical engineer to design parts of systems, to understand the total mechanical system, to plan the production and utilization of energy, to plan and operate industrial manufacturing facilities, and to design automatic control systems for machines and other mechanical systems.

In addition to the purely mechanical engineering considerations, there are many complex issues in our modern society that involve environmental, economic, managerial, and political decision-making. Therefore, mechanical engineers must possess appreciation of social and humanistic issues relating to government, business, religion, history, language, and international relations.

Curriculum

To earn a Bachelor of Science in mechanical engineering, students must complete a minimum of 128 semester hours of credit. The curriculum is arranged so that courses in the four stems are introduced in an effective sequence and with a balanced emphasis. The humanities and social science electives must be selected to satisfy the humanities and social science requirements of the College of Engineering.

Freshman Year

First Semester

4:13 Principles of Chemistry I	3 s.h.
10:3 Rhetoric	4 s.h.
22M:35 Engineering Calculus I	4 s.h.
57:5 Engineering I	3 s.h.
Humanities or social science elective	3 s.h.
Total	17 s.h.

Second Semester

4:16 Principles of Chemistry Lab I	2 s.h.
22M:36 Engineering Calculus II	4 s.h.
22M:40 Matrix Algebra for Engineers	2 s.h.
29:17 Introductory Physics I	4 s.h.
57:6 Engineering II	3 s.h.
Total	15 s.h.

Sophomore Year

First Semester

22M:42 Vector Calculus for Engineers	3 s.h.
29:18 Introductory Physics II	4 s.h.
57:7 Statics	2 s.h.
57:9 Thermodynamics I	3 s.h.
57:15 Materials Science	3 s.h.
Total	15 s.h.

Second Semester

22M:41 Differential Equations for Engineers	3 s.h.
57:8 Electrical Circuits	3 s.h.
57:10 Dynamics	3 s.h.
57:19 Mechanics of Deformable Bodies	3 s.h.
Humanities or social science elective	4 s.h.
Total	16 s.h.

Junior Year

First Semester

22S:39 Probability and Statistics for Engineering and Physical Sciences	3 s.h.
57:12 Linear Systems Analysis	3 s.h.
57:20 Mechanics of Fluids and Transfer Processes	4 s.h.
57:21 Principles of Design I	3 s.h.
57:18 Principles of Electronic Instrumentation	4 s.h.
58:91 Professional Seminar: Mechanical Engineering	0 s.h.
Total	17 s.h.

Second Semester

29:83 Modern Physics	3 s.h.
58:40 Thermodynamics II	3 s.h.
58:45 Heat Transfer	3 s.h.
58:52 Mechanical Systems	3 s.h.
58:91 Professional Seminar: Mechanical Engineering	0 s.h.
Humanities or social science elective	3 s.h.
Total	15 s.h.

Senior Year

First Semester

58:48 Thermal-Fluid Systems Design	4 s.h.
58:55 Mechanical Systems Design	4 s.h.
58:91 Professional Seminar: Mechanical Engineering	0 s.h.
Technical electives	6 s.h.
Humanities or social science elective	3 s.h.
Total	17 s.h.

Second Semester

58:80 Experimental Engineering	4 s.h.
58:86 Mechanical Engineering Project	3 s.h.
Technical electives	6 s.h.
Humanities or social science elective	3 s.h.
Total	16 s.h.

Technical Electives

These permit students to develop a broader background and a deeper understanding in selected fields of mechanical engineering. Because most of these courses build on earlier courses in the curriculum, students' choices may result from an interest developed in the basic courses. Students should consult with and obtain approval from their academic adviser before selecting elective courses.

Guidelines for selecting technical electives are as follows.

A minimum of two electives from mechanical engineering courses must be taken.

Engineering courses at the 100-level, as well as mathematics, physics, or chemistry courses at a more advanced level than those required in the curriculum, may be taken as technical electives.

One elective course may be chosen from engineering courses that are required in another engineering curriculum.

One course from the College of Business Administration may be elected, with the exception of accounting or economics courses numbered below 100. (Economics courses may be taken as social science electives.)

A maximum of 3 semester hours of individual investigation may be used as elective credit. Individual investigations are not routinely undertaken, but they may be allowed in special circumstances.

Students are encouraged to take courses in several areas to gain a broad background in mechanical engineering. Some technical elective courses are:

Control Systems Engineering

58:131 Feedback Control Systems	3 s.h.
58:132 Control System Design	3 s.h.
58:133 Control Theory	3 s.h.
58:134 Computer-Based Control Systems	3 s.h.

Mechanical Systems Engineering

58:110 Computer-Aided Engineering	3 s.h.
58:150 Intermediate Mechanics of Deformable Bodies	3 s.h.
58:151 Planar Kinematics and Dynamics of Machines	3 s.h.
58:153 Fundamentals of Vibrations	3 s.h.
58:155 Intermediate Dynamics	3 s.h.
58:159 Theories of Failure in Design	3 s.h.
58:170 Composite Materials	3 s.h.

Thermal Systems Engineering

58:140 Intermediate Thermodynamics	3 s.h.
58:145 Intermediate Heat Transfer	3 s.h.
58:148 Combustion and Propulsion Engineering	3 s.h.

Thermal-Fluid Engineering

58:160 Intermediate Mechanics of Fluids	3 s.h.
58:162 Experimental Methods in Fluid Mechanics and Heat Transfer	3 s.h.
58:165 Elements of Gas Flows	3 s.h.
58:167 Aerodynamics	3 s.h.

General

58:98 Individual Investigations: Mechanical Engineering	arr.
58:111 Numerical Calculations	3 s.h.
58:113 Mathematical Methods in Engineering	3 s.h.
58:115 Finite Element Techniques in Engineering I	3 s.h.
58:195 Contemporary Topics in Mechanical Engineering	arr.

For more information on the undergraduate program in mechanical engineering, see the *Undergraduate Handbook*, available in the department office, 2202 Engineering Building.

Graduate Programs

The goal of the graduate program in the Department of Mechanical Engineering at both the M.S. and Ph.D. levels is to educate students in the disciplines of mechanical engineering in more depth and breadth than is possible at the B.S. level. This preparation allows the graduate to use contemporary methods at advanced levels in professional careers in engineering design, development, teaching, and research. Each student's plan of study is based on his or her background and career objectives as well as on sound academic practice. Departmental faculty members have teaching and research expertise in energy conversion, fluid and thermal sciences, solid mechanics, mechanical systems, and related areas.

Students may develop programs emphasizing fluid mechanics, thermodynamics, heat transfer, fatigue and fracture mechanics, and mechanical systems. M.S. students desiring a more general program may combine emphases, while those wishing a degree of specialization in energy conversion, materials engineering, automatic control, or chemical processes may combine departmental courses and appropriate electives from other departments of the College of Engineering and the University. Ph.D. programs may center in any one of these areas through choice of appropriate course work and research topic.

Research

Fluid Mechanics

The graduate program in fluid mechanics provides the student with a rigorous and broad foundation in theoretical, numerical, and experimental aspects of the subject. It is especially suitable for those seeking careers in teaching and/or research in academic and industrial organizations. Elucidation of fundamental principles and techniques of solving problems in the various fields of application are emphasized, with focus on the use of computers, both in the mathematical modeling of flow phenomena and in the acquisition and processing of experimental data.

Although most of the relevant courses are offered by the Department of Mechanical Engineering, students are strongly encouraged to take applied mathematics and classical mechanics courses offered by the mathematics and physics departments in the College of Liberal Arts and by other departments in the College of Engineering.

Current research projects include computational modeling of viscous and turbulent flows; vortex dynamics; unsteady flows; flow separation and control; biofluid dynamics; ship hydrodynamics; viscous flow around ships; propulsor flow and propulsor-body interactions; free-surface effects; nonlinear wave theory; two-body hydrodynamic interactions; underwater acoustics; low Reynolds-number flows; quantitative flow visualization and image processing; Laser-Doppler and thermal anemometry for flow analysis.

Thermal Sciences

The graduate program in thermal sciences and systems provides students with a rigorous and broad foundation in the theoretical and experimental aspects of the subject, thus preparing them for careers in industry, teaching, and government. The program emphasizes fundamentals of thermodynamics, heat transfer, and combustion, and associated analytical, numerical, and experimental methods used in energy conversion systems. Areas of concentration include fluid mechanics, thermodynamics, heat transfer, phase-change, and combustion.

Although most of the relevant courses are offered by the department, students are encouraged to supplement them with courses from other areas, such as mathematics and physics in the College of Liberal Arts and other departments in the College of Engineering, in order to balance their programs.

Current research projects include analytical, numerical, and experimental investigations of convective and radiative heat transfer with real gas and surface effects; laminar and turbulent heat transfer; shock ignition of particle-laden gases, hot spot ignition of condensed-phase energetic materials, transition to detonation in granular materials; natural convection; turbulent jet, as well as turbulent flow; diffusion flames, spray atomization and combustion, liquid-metal combustion, boundary-layer combustion; transport phenomena in materials processing, melting and solidification, porous media, double-diffusive convection, optimal control of thermal systems; and flow visualization of complex convection processes.

Mechanical Systems

The graduate program in mechanical systems provides students with a strong background in theoretical, computational, experimental, and applied aspects of the subject and prepares them for careers in high-level applied research, advanced system analysis, design, and teaching. The program emphasizes fundamental principles, techniques, and experimentation used to analyze and design mechanical systems. Areas of concentration include machine dynamics, optimal design, structural optimization, control systems, and fatigue and fracture mechanics.

Although most of the relevant courses are offered by the Department of Mechanical Engineering, students are encouraged to take appropriate courses offered by the

mathematics, statistics, and physics departments in the College of Liberal Arts and those offered by other departments in the College of Engineering.

Current research projects include state space theory of structural optimization; design sensitivity analysis of rigid and flexible mechanical systems; computer-aided design; computer-aided engineering visualization and communication; geometric modeling; mechanical system modeling; integrated computer-aided engineering design; real-time dynamic simulation; vehicle system dynamics; dynamic systems with intermittent motion; design sensitivity analysis of structural systems; shape optimal design; optimization of built-up structures; optimal structural design under dynamic loads; computer-aided analysis; design and optimization of large-scale mechanical systems; control system modeling and simulation; design of controls for nonlinear systems based on interfacing of mechanical system and control system simulation programs; simulation of hydraulic control actuation; damage-tolerant design; and fatigue behavior and life prediction under constant and variable amplitude loading.

Master of Science

The M.S. program requires a minimum of 30 semester hours of course work and research. Students may choose either a thesis or nonthesis program. Normally 6 and no more than 9 semester hours of credit for thesis research and writing may be counted toward the 30-semester-hour requirement. Each student determines a plan of study in consultation with an adviser and submits the plan to the department chair for approval.

To earn the M.S. degree, the student must maintain a minimum grade-point average of 3.00 on a 4.00 scale on the graduate work used to satisfy the degree requirements, and must be successful in the final examination. This examination is administered by the student's committee, which consists of at least three faculty members, including at least one with primary appointment in the Department of Mechanical Engineering.

The requirements for the M.S. degree may be completed within a calendar year. However, students with assistantship duties or other constraints may take up to two calendar years to complete the degree.

Doctor of Philosophy

Typically, Ph.D. programs in mechanical engineering require approximately 90 semester hours of credit—including research for the dissertation—beyond the baccalaureate degree. Students must pass the qualifying examination administered in the department to be formally admitted to the doctoral program.

The student takes the comprehensive examination after passing the qualifying examination and when the course work specified in the plan of study is nearly completed; in any case, the exam may be taken no later than 28 months after the first registration in the Ph.D. program. To be admitted to the comprehensive examination, the student must be in good academic standing and must be recommended by his or her adviser. The exam is administered by the student's committee. Admission to the Ph.D. degree candidacy is recognized upon successful completion of the comprehensive examination.

Having satisfactorily completed the exam, the student normally has only to complete and defend the dissertation at the final examination.

Requirements for the Ph.D. degree generally can be completed in three to four years beyond the M.S. degree.

Admission

Students who have earned a baccalaureate or master's degree in an engineering curriculum or in a curriculum in the mathematical or physical sciences are eligible to be considered for admission to the graduate program in mechanical engineering. In order to be considered for regular admission, the student must have a minimum grade-point average of 3.00 on a 4.00 scale on all previous college-level work and minimum Graduate Record Examination (GRE) General Test scores of 500 verbal and 700 quantitative. A minimum Test of English as a Foreign Language (TOEFL) score of 550 may be substituted for the GRE verbal requirement for students whose native language is not English.

Students may, under exceptional circumstances, be considered for conditional admission with a lower grade-point average and/or GRE or TOEFL test scores. The student with conditional status must achieve regular status within one semester (excluding summer sessions) after admission. To satisfy this requirement, the conditionally admitted student must attain a grade-point average of at least 3.00 on an initial registration of 9 semester hours at The University of Iowa. Students who have not submitted their GRE and/or TOEFL scores by the end of the first regular semester after admission will have their registration for the subsequent semester canceled by the Graduate College.

Financial Aid

Financial support is available to M.S. and Ph.D. students, primarily through teaching and research assistantships from the Department of Mechanical Engineering, the Center for Computer-Aided Design, and the Iowa Institute of Hydraulic Research. These awards may be made on a semester, academic year, or calendar year basis. Awards and reappointments are competitive and are based on the student's potential contribution to the teaching and research goals of the department. Students who fulfill their assistantship responsibilities and continue to make satisfactory progress toward their degree objective will receive preference in new assistantship awards. Advanced doctoral students also may qualify for higher stipend instructor positions. All applications for financial support should be submitted directly to the department chair.

M.S. students with a one-quarter time or more appointment are required to register for a minimum of 9 semester hours during fall and spring semesters until they have completed 30 semester hours of course and research work beyond the baccalaureate degree; Ph.D. students with one-quarter time or more appointments must register for a minimum of 9 semester hours during fall and spring semesters until they have completed 90 semester hours of course and research work beyond the baccalaureate degree. Once they meet these minimums, graduate students must register for a minimum of 3 semester hours each semester. Students with appointments must register during summer sessions. All registrations should accurately reflect the amount and type of work undertaken, the use of University facilities, and the amount of consultation with the faculty. One semester of final M.S. or post-Ph.D. comprehensive registration is permitted for students who have completed their requirements but have not yet received their degrees.

Details on the graduate program in mechanical engineering are published in the *Graduate Student Handbook for the Department of Mechanical Engineering*, available in the department office.

Special Facilities and Laboratories

Undergraduate Instruction

Engineering Core

The laboratories for fluid flows and transport processes contain a wind tunnel; a water flume; a water table; four water channels with porous media; three air jet tables; various air, water, and oil flow devices; and facilities for numerous small-scale experiments to demonstrate the principles of mass, momentum, and energy transfer.

For information about laboratories affiliated with core courses coordinated by other engineering departments, see the subsection for each department.

Required and Elective Course Laboratories

The mechanical engineering laboratory for experimental engineering provides undergraduate students with exposure to contemporary sensors, signal conditioners, instrumentation, and computer-aided data acquisition systems.

The laboratory for mechanical engineering projects provides for either group or individual project activities in mechanical engineering design, construction of mechanisms, and testing.

The thermal and heat transfer laboratory is equipped with data acquisition systems to process data on-line on computer. Experiments in heat transfer measurements are made in this laboratory.

Graduate Facilities and Laboratories

Fluid Mechanics

The program in fluid mechanics is conducted in close collaboration with the Iowa Institute of Hydraulic Research, which houses some of the most modern research facilities in the world. The equipment available to graduate students includes several wind tunnels and hydraulic flumes, an environmental flow facility, a 300-foot towing tank, two special low-temperature flow facilities for investigation of ice phenomena, pulsatile-flow apparatus, unsteady flow water tunnel, hot-wire and laser anemometer systems, and computer-based data-acquisition systems.

In the department, the facilities available are a flow visualization and imaging system with CCD camera, a low-speed wind tunnel, a water table, and a water flume. Institute and engineering college workshops provide the necessary support.

Thermal Sciences

Facilities for research in the thermal sciences and systems consist of a spectral bidirectional reflectometer for radiant property measurements, a low-pressure combustion chamber, a diffusion flame test rig, a 20-liter explosion vessel, an air atomization spray apparatus, test stands for melting and solidification studies, and various optical measurement systems. Laser-based diagnostics (e.g., laser-induced fluorescence, planar imaging, and laser Doppler anemometry) are available for turbulent flow, heat transfer, and combustion studies. Flow visualization and imaging by CCD (Charge Couple Device camera) is available for the study of complex fluid motion, heat convection, and combustion flows.

Several laboratories are served by computer-based data-acquisition systems. Terminals connected to ICAEN and the Weeg Computing Center are available for data reduction and analysis.

Fatigue and Fracture

Experimental facilities for the fatigue and fracture mechanics segment of the department include access to a scanning electron microscope, a field computer data-acquisition system, modern servo-hydraulic closed-loop fatigue test equipment, and equipment for characterization of material properties. Normal strength of materials test equipment is also available.

Mechanical Systems

Simulation activities in the mechanical systems area are normally carried out in the Center for Computer-Aided Design and High-Speed Computing Facility Laboratory. This combined laboratory is an outstanding computer facility containing an Alliant FX8 mini supercomputer, Encore Multimax Multiprocessor, VAX 11/780, a cluster of 14 Apollo work stations, a Silicon Graphics Iris color graphics work station, Alliant VFX graphics work station, Intergraph work station, and associated hardcopy devices, as well as video animation work station capability. In addition, an experimental laboratory is available for mechanical systems experiments. Facilities include an analog computer, a dynamic system for robotic control, and a vibration system.

Courses

Special

58:000 Cooperative Education Training Assignment: Mechanical Engineering **0 s.h.**
Mechanical engineering students participating in the Cooperative Education Program register in this course during work assignment periods; registration provides a record of participation in the program on the student's permanent record. Admission to the Cooperative Education Program and consent of the cooperative education faculty adviser required.

58:80 Experimental Engineering **4 s.h.**
Principles of physical measurements; standards calibration, estimation of error; static and dynamic performance of measuring systems; laboratory experience, experiment planning, report writing. Prerequisite: 57:18. Corequisites: 58:52 and 58:45.

58:86 Mechanical Engineering Project **3 s.h.**
Application of mechanical, thermal, and fluid systems design; student or group design projects initiated at various levels in the design process and carried through to higher levels; emphasis on synthesis, written and oral communication. Prerequisite: 58:45 or 58:52.

58:91 Professional Seminar: Mechanical Engineering **0 s.h.**
Introduction to professional aspects of mechanical engineering: presentations, student/faculty interaction, professional society involvement, panel discussions, and plant trip. Junior standing required.

58:98 Individual Investigations: Mechanical Engineering **arr.**
Individual projects for mechanical engineering undergraduate students, such as a laboratory study; engineering design project; analysis, synthesis, and simulation of an engineering system; computer software development, research. Consent of adviser required.

General

58:105 Lettering **1 s.h.**
Lettering skill using pencil only; vertical and inclined single-stroke Gothic lettering. Offered only through Guided Correspondence Study.

58:107 Mechanical Drawing **2 s.h.**
Fundamentals of mechanical drawing for beginners; orthographic projections, geometric constructions, isometric pictorials, oblique pictorials, sectioned views, dimensioning, and working drawings. Offered only through Guided Correspondence Study.

58:110 Computer-Aided Engineering **3 s.h.**
Fundamentals of computer graphics, visualization of engineering design and analysis data, solid modeling, window-based user interface development; applications of these techniques to engineering problems. Prerequisite: working knowledge of FORTRAN or Pascal. Same as 53:115.

58:111 Numerical Calculations **3 s.h.**
Development of algorithms for functional approximations, numerical differentiation and integration; solution of algebraic and differential equations, with emphasis on digital computations; initial and boundary value problems. Prerequisite: 22M:41. Same as 53:111.

58:113 Mathematical Methods in Engineering **3 s.h.**
Matrices, vector spaces, eigenvalue problems, quadratic forms, series solutions of differential equations, special functions, function spaces, Fourier series, equations of mathematical physics, multiple integral theorems, and first- and second-order partial differential equations. Prerequisites: 22M:40, 22M:41, and 22M:42. Same as 53:113.

58:115 Finite Element Techniques in Engineering I **3 s.h.**
Introduction to the finite element method; basic concepts; one- and two-dimensional boundary value problems; applications to heat transfer and fluid flow; stress analysis, axial deformation, bending, torsion problems; two-dimensional elasticity problems; introduction to plate bending and shells; practical applications using commercially available software. Prerequisite: 57:19. Same as 53:133.

58:212 Analytical Methods in Thermo-Fluid Mechanics **3 s.h.**
Theory and solution techniques for first- and second-order partial differential equations; wave equation; Laplace equation; heat equation; Navier-Stokes and Energy equations; calculus of variations: Euler-Lagrange equation, Sturm-Liouville problems, Rayleigh-Ritz method; variational methods in thermo/fluids; integral equations: Green's functions, Volterra and Abel equations, Fredholm equations. Prerequisite: 58:113. Same as 53:212.

58:214 Analytical Methods in Mechanical Systems **3 s.h.**
Functional analysis applied in mechanics and dynamics; calculus of variations; variational methods such as the Ritz and Galerkin methods; ordinary differential equations; boundary and initial value problems; stability theorem; perturbation of linear systems. Prerequisite: 58:113. Same as 53:214.

58:215 Finite Element Techniques in Engineering II **3 s.h.**
Advanced topics in the finite element method; convergence considerations; higher order elements; solids of revolution; plate bending; nonlinear analysis; programming aspects; recent developments. Prerequisite: 58:115. Same as 53:233.

Thermal and Fluids

58:40 Thermodynamics II **3 s.h.**
Power and refrigeration cycles; mixtures of gases, psychometric mixtures; thermodynamics of combustion and chemical equilibrium; thermodynamics of compressible flow. Prerequisites: 57:9 and 22M:41.

58:45 Heat Transfer **3 s.h.**
Introduction to the principles of heat transfer by conduction, convection, and radiation; analytical and numerical methods of solution; applications to engineering problems. Prerequisite: 57:20.

58:48 Thermal-Fluid Systems Design **4 s.h.**
Topics related to design of thermal-fluid systems; economics, life-cycle costs, modeling of thermal-fluid systems, simulation, optimization techniques, second law considerations; projects with oral and written reports. Prerequisites: 58:40 and 58:45.

58:140 Intermediate Thermodynamics **3 s.h.**
Thermodynamics of irreversible processes, kinetic theory, statistical thermodynamics, applications to thermodynamic properties and selected topics. Prerequisite: 58:40.

58:145 Intermediate Heat Transfer **3 s.h.**
Steady and unsteady conduction; forced and natural convection; surface and gaseous radiation; condensation and evaporation; analytical and numerical methods and applications. Prerequisite: 58:45.

58:148 Combustion and Propulsion Engineering **3 s.h.**
Review of chemical kinetics, thermodynamic equilibrium, transport equations; thermodynamics of fluid flows; laminar flames: basic gas turbine cycles; propulsion systems—open gas turbine cycles, turboprop, turbofan, turbojet, ramjet; supersonic inlets; nozzle flows; contemporary propulsion concepts. Prerequisite: 58:40 or graduate standing.

58:160 Intermediate Mechanics of Fluids **3 s.h.**
Basic concepts and definitions; pressure distribution in a fluid; governing equations and boundary conditions; integral and differential analysis; dimensional analysis and

similarity; experimental analysis; laminar and turbulent internal and external flows; potential flows; engineering applications. Prerequisite: 57:20. Same as 53:169.

58:162 Experimental Methods in Fluid Mechanics and Heat Transfer **3 s.h.**
Review of theory; importance of experiments; modeling and scaling laws; experimental environment and facilities; measurements at full scale and on scaled models; use of wind and water tunnels, towing tanks, and hydraulic flumes; instruments for measuring pressure, temperature, velocity, and turbulence; error analysis; data acquisition and processing; laboratory demonstrations, hands-on experiments; project. Prerequisite: 58:80 or equivalent. Same as 53:172.

58:165 Elements of Gas Flows **3 s.h.**
Thermodynamics of compressible fluid flow, with applications of continuity, momentum, and energy equations; flow with variable and constant area, with and without friction, with and without heat transfer. Prerequisites: 57:20 and 58:40.

58:167 Aerodynamics **3 s.h.**
Equations of fluid motion; inviscid-flow theory; airfoil and wing parameters; thin- and thick-airfoil theory; viscous effects; laminar and turbulent boundary layers; flow-over-finite, unswept, swept, planar, and delta wings; introduction to compressible subsonic and transonic flow past airfoils, supercritical airfoils. Prerequisites: 22M:41 and 57:20.

58:245 Conductive Heat Transfer **3 s.h.**
Fundamentals of heat conduction and diffusive transport of mass and momentum; phenomenological laws and analogies; diffusive transport properties; steady, transient, and moving boundary problems; analytical and numerical solution techniques; inverse heat conduction; coupled heat and mass diffusion; diffusion in multiphase and multicomponent systems. Prerequisite: 58:145.

58:246 Convective Heat Transfer **3 s.h.**
Fundamentals of convective heat transfer; analysis of forced and free convection; differential and integral formulation of boundary layers; heat, mass, and momentum transfer in laminar and turbulent flows inside tubes and external surfaces; combined forced and free convection; convection at high velocities; heat transfer with phase change. Prerequisite: 58:145.

58:247 Radiative Heat Transfer **3 s.h.**
Fundamentals of radiant energy transport and analysis of radiative interchange among surfaces separated by nonparticipating and participating media; radiation properties of solids and gases; pyrometry; combined radiation-conduction and radiation-convection heat transfer. Prerequisite: 58:145.

58:248 Combustion Theory **3 s.h.**
Laminar flame theory; detonation; turbulent combustion; spray combustion; thermal ignition; pollutant formation and oxidation; combustion diagnostics. Prerequisites: 58:145, 58:160, and graduate standing.

58:260 Viscous Flow **3 s.h.**
Equations of compressible viscous flow; classical exact analytical and numerical solutions; flow regimes and approximations; laminar boundary layers—equations, solution methods, and applications; introduction to stability theory; incompressible turbulent flow—mean-flow and Reynolds-stress equations, modeling, solution procedures, and applications; introduction to compressible boundary layers. Prerequisite: 58:160. Same as 53:276.

58:262 Inviscid Flow **3 s.h.**
Flow of an inviscid, incompressible fluid; steady and unsteady two- and three-dimensional flows, irrotational flows; forces and moments acting on bodies; conformal mapping; method of images; separation of variables; slender-body theory; Green's functions and integral equations, numerical methods; inviscid compressible flow; shock waves. Prerequisite: 58:160. Same as 53:277.

58:265 Waves in Fluids **3 s.h.**
Acoustic wave theory; general solutions of plane, cylindrical, and spherical waves; reflection and refraction of sound waves; kinematic waves; shallow water waves; hydraulic jumps, infinitesimal wave theory; Kelvin ship wave patterns; nonlinear water waves; propagation of solitary waves; internal gravity waves. Prerequisites: 58:113 and 58:160.

58:267 Multiphase Flow and Heat Transfer **3 s.h.**
Basic models; adiabatic two-phase flow; pool and convective boiling; condensation; multicomponent boiling and condensation; mathematical modeling; instantaneous equations, instantaneous space-averaged equations, local time averaged equations; gas-solid flows; liquid-solid flows. Prerequisites: 58:145, 58:160.

58:268 Turbulent Flows **3 s.h.**
In-depth study of turbulent flows; statistical description of turbulence; instability and transition; turbulence closure modeling; free shear and boundary layer flows; complex shearflows; development of computational strategies; recent literature on applications and chaos phenomena. Prerequisite: 58:160.

58:269 Computational Fluid Dynamics and Heat Transfer **3 s.h.**
Derivation of governing equations for fluid flows and heat transfer; development of various numerical and algebraic approximations for elliptic, parabolic, and hyperbolic partial differential equations; solutions by finite difference and finite analytic techniques; numerical grid generation of boundary-fitted coordinate system; numerical solutions for one- and two-dimensional compressible and incompressible flow and heat transfer problems. Graduate standing required. Prerequisite: 58:111.

58:296 Advanced Topics in Thermal and Fluid Engineering **arr.**
Advanced treatment of topics in thermodynamics, fluid mechanics, heat and mass transfer, related experimental and analytical techniques; selection of subject and content determined by instructor/student interest. Graduate standing required.

Mechanical Systems

58:52 Mechanical Systems **3 s.h.**
Consideration of static strength, stiffness, reliability, and fatigue strength in the design of mechanical systems; introduction to computer techniques for mechanical system design. Prerequisites: 57:21, 57:19, and 22S:39.

58:55 Mechanical Systems Design **4 s.h.**
Design considerations for mechanical engineering systems; strength, deformation, durability of mechanical elements; safe-life, foil-safe, damage-tolerant design; standards, products liability, ethics in design; data-acquisition/life-prediction experiment. Prerequisite: 58:52.

58:131 Feedback Control Systems **3 s.h.**
Introduction to analysis of linear feedback control systems; system description; stability, time, and frequency domain techniques; computer simulation; classical and state space formulations. Prerequisites: 57:12 and 22M:41.

58:132 Control System Design **3 s.h.**
Design techniques for linear control systems; state feedback and classical compensation methods; emphasis on physical system behavior. Prerequisite: 58:131 or equivalent. Same as 55:161.

58:133 Control Theory **3 s.h.**
Introduction to state space approach; controllability, observability, canonical forms, Luenberger observers, feedback control via pole placement, stability, minimal realization and optimal control. Prerequisite: 55:60 or 58:131. Same as 55:160.

58:134 Computer-Based Control Systems **3 s.h.**
Introduction to discrete and digital control systems; application of computers in control, sampling theorem, discrete time system models, analysis and design of discrete time systems, parameter estimation, examples of optimal and adaptive controls; lab arranged. Prerequisite: 55:60 or 58:131. Same as 55:164.

58:150 Intermediate Mechanics of Deformable Bodies **3 s.h.**
Application of equilibrium analyses, strain-displacement relations, and constitutive relationships to practical structural systems and elementary plane elasticity problems. Prerequisite: 57:19. Same as 53:140, 51:151.

58:151 Planar Kinematics and Dynamics of Machines **3 s.h.**
Modeling techniques in kinematic and dynamic analysis of constrained planar mechanical systems; numerical methods in solving equations of kinematics and dynamics; emphasis on computational methods of large-scale systems. Prerequisites: 57:10 and 58:52.

58:153 Fundamentals of Vibrations **3 s.h.**
Fundamental aspects of vibration of linear discrete and continuous mechanical and structural systems; harmonic, periodic, and arbitrary excitation; modal analysis; applications. Prerequisite: 57:19. Same as 53:132.

58:155 Intermediate Dynamics **3 s.h.**
Theoretical and applied Newtonian, Eulerian, Lagrangian, and variational analyses of particles and rigid bodies in equilibrium and accelerated motion. Prerequisite: 57:10.

58:159 Theories of Failure in Design **3 s.h.**
Definition and criteria for failure, yield phenomena, linear elastic fracture mechanics, plane stress and plane strain fracture toughness, J-integral, COD, stress corrosion cracking, fatigue, safe-life, fail-safe, and damage tolerant design. Prerequisites: 57:19, 58:55 or 58:150 or equivalent. Same as 53:149.

58:170 Composite Materials **3 s.h.**
Principles of the mechanics of solid multiphase systems, with applications in lightweight structures, ultrastrong materials, and materials for the protection of the body and replacement of human tissues; composites with fibrous, lamellar, particulate, and cellular structures, composites of biological origin. Prerequisite: 58:150. Same as 51:177.

58:231 Advanced Control Theory **3 s.h.**
Optimal control, tracking control, state reconstruction, nonlinear systems, linearization, describing function, optimal filtering. Prerequisite: 55:160. Same as 55:266.

58:250 Advanced Computer-Aided Engineering **3 s.h.**
Object-oriented engineering system abstraction, C++ programming technique, object-oriented software construction for engineering problems, and engineering knowledge on software development methodology and computer networks. Graduate standing required.

58:251 Continuum Mechanics and Elasticity **3 s.h.**
Cartesian tensors and geometric foundations; concept of stress, strain, and motion; fundamental physical laws; constitutive equations and finite elasticity; equations of linear elasticity; elastic extension, torsion, and bending of bars. Prerequisites: 53:140 and 53:113. Same as 53:241.

58:252 Mechanical Design in Dynamics **3 s.h.**
Advanced topics in mechanical system dynamic analysis, synthesis, and design optimization. Prerequisites: 58:151, 58:155, and 58:253.

58:253 Computational Methods in Dynamics **3 s.h.**
Computational methods in formulation and computer solution of equations of motion of large-scale mechanisms and machines; planar and three-dimensional systems. Prerequisites: 58:113, 58:151, and 58:155.

58:254 Energy Principles in Structural Mechanics **3 s.h.**
Principles of virtual work; stationary and minimum potential energy; calculus of variations; Ritz method, Galerkin's method; beams and plates; Hamilton's principle; elastic stability; extremum principle of plasticity. Prerequisites: 58:113 and 58:150. Same as 53:244.

58:255 Topics in Solid Mechanics **3 s.h.**
Plane theory of elasticity; stress around a crack tip; flow theory of plasticity and application; crack-tip plastic zone; simple mechanical models of viscoelastic behavior. Prerequisite: 58:251 or equivalent. Same as 53:242.

58:257 Theory of Viscoelasticity **3 s.h.**
Linear theory of viscoelasticity; non-aging materials; Boltzmann superposition principle, linear functionals; thermodynamic foundations; time-temperature superposition principle; boundary and initial value problems. Prerequisite: 58:150 or 58:251. Same as 51:257, 53:247.

58:258 Continuum Mechanics and Plasticity **3 s.h.**
Finite strain measures and rate of deformation; principles of isotropy and materials indifference; constitutive equations of elastic and inelastic materials; internal variable theory of thermodynamics; endochronic theory of plasticity. Prerequisite: 53:241 or equivalent. Same as 53:246.

58:259 Mechanical Design in Structures **3 s.h.**
Discrete and continuum variational equilibrium equations, discrete design sensitivity analysis for static responses and eigenvalues, interactive design work station, continuum sizing design sensitivity analysis for static responses and eigenvalues, design sensitivity analysis of structural dynamics, differentiability theory, shape optimal design, shape design sensitivity analysis, design sensitivity of nonlinear structural systems. Prerequisites: 58:113, 58:150, and 58:115.

Graduate Seminars, Advanced Topics, and Research

58:190 Readings in Mechanical Engineering **arr.**
For non-engineering majors who want credit in undergraduate engineering courses. May be repeated. Graduate standing required.

58:191 Graduate Seminar: Mechanical Engineering **0 s.h.**
Presentation and discussion of recent advances and research in mechanical engineering by guest lecturers, faculty, and students. Graduate standing required.

58:195 Contemporary Topics in Mechanical Engineering **arr.**
New topics in fluid and thermal sciences and mechanical systems not covered in other courses; topic and coverage determined by student/faculty interest. Junior standing required.

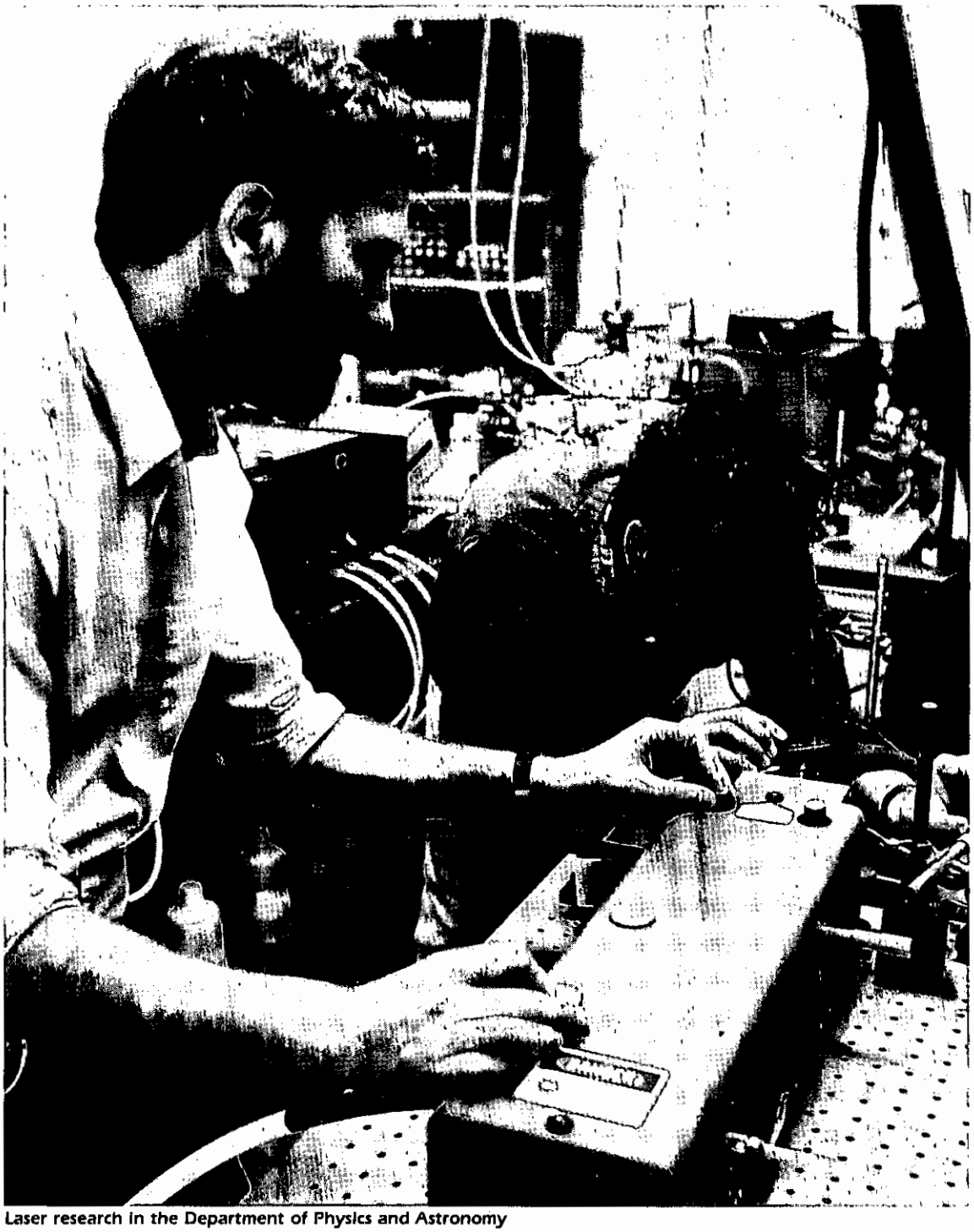
58:198 Individual Investigations: Mechanical Engineering **arr.**
Individual project in mechanical engineering, for department graduate students; laboratory study, engineering design project, analysis and simulation of an engineering system, computer software development, research. Graduate standing and consent of adviser required.

58:199 Research: Mechanical Engineering, M.S. Thesis **arr.**
Experimental and/or analytical investigation of an approved topic for partial fulfillment of the requirements for the M.S. degree with thesis in mechanical engineering. Graduate standing and consent of adviser required.

58:299 Research: Mechanical Engineering, Ph.D. Dissertation **arr.**
Experimental and/or analytical investigation of an approved topic for partial fulfillment of the requirements for the Ph.D. degree in mechanical engineering. Consent of adviser required.

Meeting company representatives during Careers Day on campus

Graduate College



Laser research in the Department of Physics and Astronomy

Acting dean: Leodis Davis
Dean for advanced studies: Rudolph W. Schulz
Associate deans: James F. Jakobsen, Charles M. Mason
Graduate examiner: Caren Cox

The University of Iowa has been a leading center of advanced study for three-quarters of a century. Presently, more than one-fifth of its enrollment is in the Graduate College. This unusually high ratio reflects the breadth of the University's graduate programs and resources, the strength of a graduate faculty with a long tradition of personal and professional concern for students, and the opportunities afforded graduate students for involvement, recognition, and support.

The Graduate College is responsible for the review and approval of proposals for new graduate programs and for the periodic survey and evaluation of existing programs. Through its administration of scholarship, fellowship, and research assistantship funds, the college encourages research and strengthening of departments. In cooperation with the Office of the Vice President for Research, it offers assistance to individual faculty members in finding the resources necessary for research projects, and it works with the other colleges and departments of the University to formulate policies concerning selection, supervision, and support of graduate students.

The faculty of the Graduate College is made up of all University faculty members at the ranks of assistant professor, associate professor, and professor. A 12-member Graduate Council, elected from and by the graduate faculty and the Graduate Student Senate, is the executive committee of the graduate faculty and is advisory to the dean of the Graduate College.

Degree Programs

The Graduate College confers the Master of Arts (M.A.), Master of Science (M.S.), Master of Business Administration (M.B.A.), Master of Arts in Teaching (M.A.T.), Master of Fine Arts (M.F.A.), Master of Physical Therapy (M.P.T.), Educational Specialist (Ed.S.), Master of Social Work (M.S.W.), Master of Comparative Law (M.C.L.), Doctor of Philosophy (Ph.D.), and Doctor of Musical Arts (D.M.A.) degrees.

The college currently confers degrees in the following major fields:
Accounting—M.A.*
Afro-American Studies—M.A.*
American Studies—M.A.*, Ph.D.
Anatomy—M.S., Ph.D.
Anthropology—M.A.*, Ph.D.
Applied Mathematical Sciences—Ph.D.
Art—M.A., M.F.A.
Art History—M.A.*, Ph.D.
Asian Civilizations—M.A.*
Astronomy—M.S.*
Biochemistry—M.S., Ph.D.
Biology—M.S.*, Ph.D.
Biomedical Engineering—M.S.*, Ph.D.
Botany—M.S.*, Ph.D.
Business Administration—M.A.*, M.B.A.**, Ph.D.
Chemical and Biochemical Engineering—M.S., Ph.D.
Chemical Physics—M.S., Ph.D.
Chemistry—M.S.*, Ph.D.
Civil and Environmental Engineering—M.S.*, Ph.D.
Classics—M.A.**, Ph.D.
Communication Studies—M.A.*, Ph.D.
Comparative Law—M.C.L.**
Comparative Literature—M.A.*, M.F.A.,Ph.D.
Computer Science—M.S.*, Ph.D.
Criminal Justice and Corrections—M.A.**
Dance—M.F.A.
Dental Hygiene—M.S.
Dental Public Health—M.S.
Economics—M.A.*, Ph.D.
Education—M.A.*, M.A.T.**, Ed.S.**, Ph.D.
Electrical and Computer Engineering—M.S.*, Ph.D.
Endodontics—M.S.
English—M.A.*, M.F.A., Ph.D.
French—M.A.*, Ph.D.
Genetics—Ph.D.
Geography—M.A.*, Ph.D.
Geology—M.S.*, Ph.D.
German—M.A.*, Ph.D.
Greek—M.A.**
History—M.A.*, Ph.D.
Home Economics—M.A.***, M.S.***
Hospital and Health Administration—M.A.*, Ph.D.
Human Nutrition—Ph.D.
Industrial and Management Engineering—M.S.*, Ph.D.
Journalism—M.A.*
Latin—M.A.**
Leisure Studies—M.A.*
Library and Information Science—M.A.*
Linguistics—M.A.*, Ph.D.
Mass Communications—Ph.D.
Mathematics—M.S.*, Ph.D.
Mechanical Engineering—M.S.*, Ph.D.
Microbiology—M.S., Ph.D.
Molecular Biology—Ph.D.
Museum Methods—M.A.***
Music—M.A.*, M.F.A., D.M.A., Ph.D.
Neuroscience—Ph.D.
Nursing—M.A., Ph.D.
Operative Dentistry—M.S.
Oral and Maxillofacial Surgery—M.S.
Orthodontics—M.S.
Pathology—M.S.
Pediatric Dentistry—M.S.
Periodontology—M.S.
Pharmacology—M.S., Ph.D.
Pharmacy—M.S.*, Ph.D.
Philosophy—M.A.*, Ph.D.
Physical Education—M.A.*, Ph.D.
Physical Therapy—M.A., M.P.T.**
Physics—M.S.*, Ph.D.
Physiology and Biophysics—M.S., Ph.D.
Political Science—M.A.*, Ph.D.
Preventive Medicine and Environmental Health—M.S.*, Ph.D.
Prosthodontics—M.S.
Psychology—M.A.*, Ph.D.
Public Affairs—M.A.**
Quality Management and Productivity—M.S.*
Radiation Biology—M.S., Ph.D.
Religion—M.A.*, Ph.D.
Russian—M.A.*
Science Education—M.S.*, Ph.D.
Social Studies—M.A.*
Social Work—M.S.W.*
Sociology—M.A.*, Ph.D.
Spanish—M.A.*, Ph.D.
Speech Pathology and Audiology—M.A.*, Ph.D.
Statistics—M.S.*, Ph.D.
Stomatology—M.S.
Theatre Arts—M.F.A.
Urban and Regional Planning—M.A.*, M.S.*

*Degree offered with or without thesis
**Nonthesis degree
***Student entry suspended

Ad Hoc Interdisciplinary Ph.D. Programs

In addition to the degree programs listed above, the graduate faculty has authorized the awarding of ad hoc interdisciplinary Ph.D. degrees. There are no provisions for ad hoc interdisciplinary programs at the master's level. Students seeking approval for ad hoc interdisciplinary Ph.D. programs must previously have been admitted to and enrolled in a departmental program in the Graduate College. For details, see Section XII,E. in "Rules and Regulations of the Graduate College" in this section of the *Catalog*.

Aging Studies Program

The Aging Studies Program is a multidisciplinary nondegree program administered by the College of Liberal Arts in cooperation with other colleges of The University of Iowa. The program is designed to complement graduate degree programs for students with academic, professional, research, or service career interests in aging. An entry is made on a student's transcript certifying completion of an approved curriculum in aging studies. For further details, see "Aging Studies Program" in the College of Liberal Arts section of the *Catalog*.

Applied Mathematical Sciences

The program in Applied Mathematical Sciences is a broad-based interdisciplinary program leading to the Ph.D. degree. Students combine study of theoretical and applied aspects of a mathematical science (mathematics, statistics, or computer science) with study in a science (behavioral, biological, engineering, medical, physical, or social). See "Applied Mathematical Sciences" under "Division of Mathematical Sciences" in the College of Liberal Arts section of the *Catalog* for a list of faculty and a further description of the program.

Center for International and Comparative Studies

The Center for International and Comparative Studies (CICS) coordinates and supports interdisciplinary studies at The University of Iowa. Founded as a faculty committee in mid-1981, CICS was recognized as an academic center by Iowa's State Board of Regents in April 1984. In 1985 and again in 1988, CICS was awarded grants from the U.S. Department of Education to establish a Title VI National Resource Center on International Studies, one of only nine such centers in the United

States. The grants support a variety of research and instructional activities that focus on language and communication, international health, and international development. Funding from other sources supports additional research and instructional activity in global studies and other area studies, the arts, and human rights.

As a national resource center, CICS serves the state, the region, and the nation by making available the human and bibliographic resources of the University through a variety of programs, publications, and research activities. Within the University, the center extends financial support to existing international programs while encouraging new research and new teaching activities. It emphasizes international studies in three major areas: research support and development for University faculty and students; instructional programs at the undergraduate and graduate levels; and public programs and outreach activities.

The center is administered by a half-time faculty director, a full-time assistant director, and an executive committee of the faculty chairs of the nine CICS constituent programs (see "Interdisciplinary Programs," below). CICS offices and classrooms are located in the International Center. The center is linked administratively to the Office of the Vice President for Academic Affairs.

Interdisciplinary Programs

Nine interdisciplinary programs are represented in CICS. Five promote instruction and research with a geographical focus: the African Studies Program (ASP), the Program in Asian Civilizations (PAC), the Global Studies Program (GSP), the Latin American Studies Program (LASP), and the Soviet and East European Studies Program (SEESP). These five also are involved with graduate and undergraduate instructional programs in the College of Liberal Arts (for further details, see the appropriate sections in the College of Liberal Arts section of the *Catalog*).

The remaining four programs pursue instructional and research activities along topical lines: the Health and Development in Agrarian Societies Program (HADAS), the Project for International Communication Studies (PICS), the Program for International Development (PID), and Women in International Development (WID).

The center also houses or works closely with four affiliated programs: the Artists, Artisans, and Traditional Technologists in Development Project, the Development Support Communications Program, the Committee on Socioeconomic Justice and Human Rights, and the Foreign Language Assessment Project.

Faculty members and students active in center programs represent all colleges of the University and every department in the College of Liberal Arts.

International Research

Each year, the center awards research and curriculum development grants to faculty and staff, Language and Area Studies Fellowships to graduate scholars, and Research and International Studies Scholarships to undergraduate scholars. It supports research projects in Africa, Asia, Latin America, and the United States that involve faculty and staff exchanges, technical assistance, development consultancies, and internships. In conjunction with University Libraries, it also publishes faculty research in the *Iowa International Papers* and the *Iowa International Bibliographic Guides*. A number of visiting foreign scholars and research fellows are affiliated with the center each year, working there from a month to a year. They offer workshops, seminars, and lectures and work on their own research.

Instructional Programs

The center supports instruction through courses, seminars, and news colloquia; curriculum development grants awarded to faculty each year; and degree programs offered by the center's constituent programs in conjunction with academic units. Courses are taught by center faculty, postdoctoral research associates, visiting foreign faculty, and fellows in the Distinguished Visiting Professionals Program. Students earn certificates in African studies, global studies, and Latin American Studies; minors in global studies and Latin American studies; majors in global studies; and master's degrees in development support communication, administered by the School of Journalism.

Public Programs and Outreach

More than 100 public lectures, seminars, films, and conferences are sponsored by the center and its constituent programs each year, and CICS cooperates with the Iowa City Foreign Relations Council as well as with other community organizations in providing speakers, training workshops, and other outreach resources. The center also publishes a newsletter four times a year. These public programs and outreach activities are free and open to the University community and the public.

Genetics

The Ph.D. program in genetics is an interdepartmental program involving members of the Departments of Biochemistry, Biology, Botany, and Microbiology as well as a number of faculty members in clinical departments. See "Genetics" in the College of Liberal Arts section of the *Catalog* for a list of participating faculty, degree requirements, and courses offered.

Human Nutrition

The Human Nutrition Program provides interdisciplinary training for doctoral candidates who desire careers in research or teaching in a medical setting. See "Human Nutrition" in the College of Medicine section of the *Catalog*.

Interuniversity Center for Film and Critical Studies in Paris

Program coordinators: Charles F. Altman, J. Dudley Andrew

The University of Iowa is one of a consortium of 21 colleges and universities associated with the Council on International Educational Exchange (CIEE), that sponsors a Film Studies Program and a Contemporary Criticism and Culture Program. These are two unique academic opportunities offered at the Centre Universitaire Américain du Cinéma et de la Critique à Paris.

The Film Studies Program is designed to explore film theory and analysis—not to train filmmakers or technicians. The curriculum provides courses and seminars in film theory, formal structures, history, and ideology. Participants study the relationships between film and other art forms, film culture, film and language, and film and psychoanalysis. Students discuss themes such as the evolution of the early cinema; the silent films of Griffith, Lang, Eisenstein, and Keaton; the classic Hollywood film; French cinema during and after the transition to sound; and European and American avant-garde cinemas. Participants study the works of Metz, Freud, Barthes, Lacan, Althusser, Foucault, and others to gain an understanding of contemporary French culture, mass media, and the visual arts.

The Contemporary Criticism and Culture Program focuses on recent developments in French political thought and social institutions, linguistics, social sciences, and literary theory. It draws on recent theoretical concepts in the fields of linguistics, psychoanalysis, anthropology, history, and philosophy to analyze verbal and audiovisual representations in literature, painting, photography, film, and television. The interdisciplinary nature of this program makes it relevant not only to French majors, but also to students of other disciplines concerned with the problems of criticism and culture. It is of particular value to those who want to explore the applicability of modernist French theory to a variety of disciplines.

A recent addition to the program is a specialization in history characterized by the application to historical research of insights from other fields, such as linguistics, cultural geography, anthropology, sociology, and economics. Particularly distinctive in the French historical approach has been a preoccupation with the long-term evolution of populations and the social, economic,

and cultural development of groups of ordinary people, seen in their urban or regional contexts.

Students may concentrate in one of these programs entirely or develop an individual program combining elements from both study center components.

Participating students are registered in the University of Paris III—Censier and are eligible to take selected courses within the University of Paris as well as those directly sponsored by the center. The program is open to both undergraduate and graduate students from The University of Iowa. For further information contact the program coordinators.

Joint Law and Graduate Degree Programs

Joint programs under which students can simultaneously pursue degrees in the College of Law and the Graduate College have been developed with the law college and a number of departments in the Graduate College. For further details see the College of Law section of the *Catalog*.

Joint Programs within the Graduate College

Various joint programs have been developed whereby students simultaneously work toward two graduate degrees. Consult the appropriate sections of this *Catalog* for further information. Established joint programs include Business Administration/Library and Information Science; Economics/Urban and Regional Planning; Hospital and Health Administration/Business Administration; Hospital and Health Administration/Urban and Regional Planning; Social Work/Urban and Regional Planning; and Preventive Medicine and Environmental Health/Urban and Regional Planning.

Medical Scientist Training Program

The Medical Scientist Training Program (MSTP) is an interdisciplinary M.D.-Ph.D. program offered jointly by the College of Medicine and the Graduate College. See "Medical Scientist Training Program" in the College of Medicine section of the *Catalog*.

Molecular Biology

The Ph.D. program in molecular biology is interdisciplinary in nature, in nature involving members of the Departments of Biology, Biochemistry, Medicine, Microbiology, Pathology, and Physiology and Biophysics. See "Molecular Biology" in the College of Medicine section of the *Catalog*.

Neuroscience Program

The Neuroscience Program is designed to provide an interdisciplinary and interdepartmental approach to graduate education and research training aimed at understanding the structure, function, and development of the nervous system and its role in behavior. See "Neuroscience Program" in the College of Medicine section of the *Catalog*.

Physician Assistant/ Preventive Medicine and Environmental Health Joint Program

Students who already have a baccalaureate degree may jointly pursue a Master of Science degree with a major in preventive medicine and environmental health in the Graduate College and a Bachelor of Science degree in the Physician Assistant Program in the College of Medicine. See "Physician Assistant Program" and "Preventive Medicine and Environmental Health" in the College of Medicine section of the *Catalog*.

Quality Management and Productivity

The interdisciplinary Program in Quality Management and Productivity leads to the M.S. degree. Cosponsored by the Departments of Statistics and Actuarial Science, Industrial and Management Engineering, and Management Sciences, the program seeks to train students who are interested in the total quality management of products and services, an area of increasing importance in business and industry. Details are provided in the College of Business Administration section of the *Catalog*.

Transportation Studies

The Program in Transportation Studies is an interdisciplinary, nondegree-granting program that deals with the planning, analysis, and operation of transportation systems. Students participate in the program in conjunction with work toward a graduate degree in civil and environmental engineering, geography, or urban and regional planning. When the graduate degree is awarded, an entry is made on the student's transcript certifying completion of the Program in Transportation Studies. For further details, see "Transportation Studies" in the College of Liberal Arts section of the *Catalog*.

Urban and Regional Planning

The graduate program in urban and regional planning is a professional master's program that prepares students for widely varied positions in government and the private sector. The program has a strong policy orientation that enables its graduates to understand the factors affecting a particular urban or regional problem and to develop workable solutions. Students may choose to specialize in transportation, environmental quality, land use, housing, and several other areas. A number of joint degrees are offered. For further details, see "Urban and Regional Planning" in the College of Liberal Arts section of the *Catalog*.

Research Resources

The many and diverse research activities of the University are centrally administered by the Office of the Vice President for Research, which has a cooperative relationship with the Graduate College. For further information, see "Research Activities" in the Special Resources at Iowa section of the *Catalog*.

Financial Assistance

Approximately half of the University's graduate students receive some form of University-administered financial assistance. Eligibility requirements and application procedures are set forth in "Section VII, Graduate Appointments" in "Rules and Regulations of the Graduate College." The following are the primary sources of assistance.

Teaching and Research Assistantships

Available in most departments; stipends typically range between $9,000 and $10,500 for half-time assistants; assistants also are eligible for tuition scholarships. Assistants (one-quarter time or more) are classified as residents for fee purposes.

Iowa Arts Fellowships

For first-year University of Iowa graduate students entering M.F.A. programs; typical stipends are $10,000 for the academic year, with all tuition paid, for as many as two years (the second year being contingent on demonstrated exceptional progress toward completion of the M.F.A. degree; no departmental service obligations.

Iowa Foundation Fellowships

One-year awards for doctoral students new to graduate study at The University of Iowa; 12-month stipend of $12,000, with all tuition paid; no departmental service obligations.

The University of Iowa Fellowship Program

For first-year graduate students entering doctoral programs; typical stipends are $14,500 per year on a year-round basis, with all tuition paid, for as many as four years; departmental participation assures that the recipient will be involved in teaching, research, and departmental affairs; in two years out of four and in all summers, recipients may pursue studies, research, or writing full time.

Scholarships

Scholarships provide up to full tuition and fees.

Graduate Fellowships

Graduate fellowships provide $8,000 for the academic year.

Other Sources

University and National Direct student loans are available through the University's Office of Student Financial Aid.

Many departments offer additional support through traineeships, part-time employment in research, or part-time teaching appointments. The Office of the Vice President for Research maintains a library of information on public and private agencies that provide funds for research and graduate study. Much material has been collected concerning awards for overseas study.

Graduate Student Senate

The Graduate Student Senate is the University graduate student body representative organization. Representatives are elected annually from each University department that has a graduate degree program. The senate's primary purpose is to serve the interests of the graduate student body in matters affecting its welfare. The senate advises the dean of the Graduate College on matters pertaining to the college.

Rules and Regulations of the Graduate College

The following text is from the *Manual of Rules and Regulations of the Graduate College.*

The Academic Program

Section I. Admission to the Graduate College

A. Application Procedure

All students seeking to register for the first time in the Graduate College of The University of Iowa must secure a formal admission statement from the director of admissions. Applicants may obtain the proper forms from the director of admissions, The University of Iowa, Iowa City, Iowa 52242.

In addition to these forms, official transcripts from each undergraduate and graduate institution attended must be submitted to the director of admissions by the designated deadline prior to the session in which admission is expected. Specific deadline dates will be established by the dean of the Graduate College and the director of admissions and printed in the *Catalog* and elsewhere.

B. Graduate Record Examination

All applicants prior to consideration for admission should take the General (Aptitude) Test of the Graduate Record Examination (GRE) or, for applicants to graduate programs in business administration, the Graduate Management Admission Test (GMAT). Applicants for whom admission data are complete, with the exception of scores on the GRE or the GMAT, may, depending on departmental policy, be admitted if they meet all other requirements. The GRE, or the GMAT, must be taken before the end of the student's first session of enrollment. The test is given several times a year at test centers established under the direction of Educational Testing Service, Princeton, New Jersey. The judgment of acceptable levels of performance on this test and its weight in the decision on admission of a student is left to the departments. Some departments in fields where GRE Subject (Advanced) Tests are available require these in addition to the General (Aptitude) Test. Inquiries about the General (Aptitude) Test may be directed to University Evaluation and Examination Service, and inquiries about the requirement of the Subject (Advanced) Test should be addressed to the executive of the department in which the applicant is interested.

C. English for Foreign Students

Prior to consideration for admission, foreign student applicants whose native language is other than English must take and pass TOEFL (Test of English as a Foreign Language), unless they have received a degree from an accredited college or university in the United States, the United Kingdom, Canada (except Quebec), Australia, or New Zealand. The examination is given at various times of the year and in many centers throughout the world. Inquiries should be addressed to the director, TOEFL, Educational Testing Service, Princeton, New Jersey 08541.

Foreign students transferring from unfinished degree programs of other universities in the United States who have not taken this examination, or who have received a grade lower than the minimum established by the Graduate College dean, must take the TOEFL examination and receive a passing grade prior to consideration for admission.

The Graduate College will advise the departments of those students barely passing the TOEFL test. Individual departments may require such students to take and pass a course at The University of Iowa in English usage designed especially for foreign students.

D. Early Admission

A student who is within six semester hours of having satisfied all the requirements for the bachelor's degree at The University of Iowa or any other accredited college may be given provisional admission.

E. Candidacy

Admission to the Graduate College is not the equivalent of acceptance as a candidate for an advanced degree, which must be earned through work successfully completed at The University of Iowa. (See "Section X. Master's Degrees," "Section XI. Two-Year Degrees," and "Section XII. Doctor's Degrees.")

F. Declaration of Major and Degree

Every applicant for admission must indicate on the application form the department or program of major interest and the degree, certificate, or professional objective he or she intends to pursue. The only exceptions to this regulation are the limited number of applicants registered as "special students." (See definition of "special status" in next paragraph.) Changes in the major or degree status may be made in the course of a student's graduate study with the approval of the department to which the transfer is proposed. To initiate such action the student must file a change of major or degree status in the Office of Admissions.

G. Status upon Admission

All students upon admission fall into one of the following categories:

1. *Regular*—Students who have met the minimum requirements for admission and who have been accepted by a department, or interdepartmental degree program, for work leading to a graduate degree or certificate or professional (or personal) improvement.

2. *Conditional*—Students who are interested in working toward a graduate degree or certificate but who are required by a department to demonstrate their ability to do satisfactory graduate work before being admitted to regular status. To be admitted on a conditional basis, the student must be recommended by a department, which will assume responsibility for advising him or her. (See minimum grade-point requirements, "Section I.H.") The student on conditional status must achieve regular status within two sessions of registration in the Graduate College by attaining a grade-point average of at least 2.50 (3.00 for doctoral students) and acceptance by the major department, or be dismissed.

3. *Special*—Students with a valid bachelor's degree and at least a 2.30 grade-point average who are not planning to become candidates for a graduate degree or certificate. Registration as a special student is allowed for only one semester or summer session. Before registration for any subsequent session, including another summer session, a special student must file an application and be admitted by a department or program to regular or conditional status. A student registering as a special student can take no more than two courses during a semester or eight semester hours during the eight-week summer session.

H. Minimum Requirements for Admission

Graduates of any college or university accredited by regional accrediting associations may be admitted to the Graduate College if their academic records meet the required standards. For nondoctoral students, a minimum grade-point average of 2.30 is required for admission to conditional status. A minimum of 2.50 is required for admission to regular status. The grade-point average is

computed only on graduate work if the student has completed at least 12 graduate hours. If the student has not completed 12 graduate semester hours, the grade-point average is computed upon the undergraduate and graduate work completed. In cases in which a student applying for admission has a grade-point average below the minimum required, but has a Graduate Record Examination score above a point to be designated by the Graduate College dean, his or her papers shall be forwarded to the department concerned for examination and decision.

Students applying for admission to a doctoral program with 12 or more semester hours of graduate work must meet a minimum grade-point average of 3.00 on the graduate work. For students with less than 12 semester hours of graduate work, a minimum of 2.70 is required on the entire record of collegiate work.

Departments, or committees in charge of interdepartmental degree programs, may, and often do, set higher minimum admission requirements than those set forth above for the Graduate College as a whole. Information concerning departmental or program requirements may be obtained directly from the executive of the department concerned.

For State Board of Regents' formal admission requirements, see "Appendix" of the *Catalog*.

I. Admission of Faculty Members to Graduate Study

Persons who hold faculty rank of assistant professor (including clinical assistant professor) or above at The University of Iowa may be admitted as special students. (See "Section G" above.) A person holding faculty rank as specified above may petition the Graduate College dean for permission to enter a departmental program for work leading to an advanced degree, certificate, or professional improvement except in the department of his or her appointment or a closely related department. Such petitions must have prior approval of the department of appointment, dean of the college of appointment, the department in which study is to be pursued, and the Graduate Council.

J. Readmission

Students who are admitted to and enroll in the Graduate College, but who then fail to register for a period of 36 months or more, must apply for readmission. Their acceptance is dependent upon departmental approval for the session in which readmission is desired. Consideration of the application for readmission will be governed by the departmental and Graduate College admissions standards in effect at the time of reapplication.

Section II. Registration

A. Standard Schedule

Students registered in the Graduate College may register for no more than 15 semester hours of credit in graduate courses. In a schedule of mixed graduate and undergraduate courses, two hours of undergraduate credit may be substituted for one semester hour of graduate credit, with registration limited to a total of 18 semester hours. This equivalency applies to the calculation of academic load only. Graduate credit is not given for courses numbered under 100. The maximum for the eight-week summer session is eight semester hours, or nine semester hours if two or more semester hours of undergraduate work are included.

The maximum semester-hour registration for work scheduled outside of the regular eight-week summer session will be arranged on a basis proportionate to that stated above with the approval of the Graduate College dean. Nine semester hours in the regular semester constitute full-time registration. (Fellows are required to carry at least nine semester hours during a semester as a condition of their appointments.) One-quarter-time and one-third-time appointees are permitted to register for the maximum 15 semester hours per semester and eight semester hours during the eight-week summer session.

B. Courses Not Included in Total Registration

In addition to a full schedule, a graduate student may register for courses printed in the *Schedule of Courses* as carrying zero semester hours credit.,

C. Changes in Announced Credit

Graduate students may not register for more credit in any course than that printed in the *Schedule of Courses,* but may register for less credit, or no credit, by permission of the instructor. The number of courses a graduate student may take for limited or no credit is subject to the consent of the adviser and the approval of the dean of the Graduate College.

D. Reduced Schedules for Teaching and Research Assistants and Other Appointees

1. One-half-time appointees may register for not more than 12 semester hours during a semester or six semester hours during the eight-week summer session.

2. Five-eighths-time appointees may register for not more than 10 semester hours during a semester or five semester hours during the eight-week summer session.

3. Two-thirds- and three-quarter-time appointees may register for not more than nine semester hours during a semester or five semester hours during the eight-week summer session.

4. Seven-eighths-time appointees may register for not more than seven semester hours during a semester or four semester hours during the eight-week summer session.

5. Full-time appointees, including full-time instructors, may register for not more than six semester hours during a semester or three semester hours during the eight-week summer session.

E. Retroactive Registration

No form of retroactive registration is permitted.

F. Registration for Part of a Session

A graduate student may register at any time during the semester or the eight-week summer session for not more than one semester hour of credit for each of the remaining weeks of classes (not including the examination period) in the term. The total registration may not exceed the 15 semester hours permitted for a semester and the eight semester hours permitted for the eight-week summer session. Registration after the last day of the third week of a semester or the third day of the second week of a summer session is permitted only in courses involving special projects, readings, individual study, thesis, or research, with the signed approval of the instructor concerned and the Graduate College dean.

G. Extramural Registration

After admission to a departmental program in the Graduate College, registration for work done off campus may be accepted for residence credit under the following circumstances:

1. Traveling Scholar Program of the Committee on Institutional Cooperation (see "Section III").

2. Research at approved locations under the direction of members of the graduate faculty of The University of Iowa.

3. Field work as part of a regularly scheduled course or research program.

4. Courses taught off campus by members of the graduate faculty (see "Section X.D" and "Section XII.C" for minimum semester hours required on campus for the master's and doctor's degrees).

5. Residence graduate credit from another Iowa Regents' university (see "Section V.B").

6. As many as nine semester hours of graduate work taken at the Quad-Cities Graduate Center from faculty other than faculty of the Iowa Regents' universities, provided the work is acceptable to the student's major department for the specified degree.

Extramural registration does not count toward residence credit in the following circumstances:

1. Course work transferred from another institution,

2. Correspondence courses.

H. Extramural Fees and Privileges

Extramural course work may be counted as residence credit only if the student has been admitted to a departmental program in the Graduate College (see "Section I.G") and pays established fees. (See "Section

XII.K" for special fees applicable to postcomprehensive registration, which should not be confused with extramural registration for residence credit.)

I. Correspondence Courses

Correspondence study credits do not count as residence credits. Not more than nine semester hours of graduate correspondence work can be applied toward an advanced degree. Such credit must be acceptable for the student's plan of study and must be earned after the student has enrolled in the Graduate College. In some instances, graduate-level correspondence study credit earned after a student has received a bachelor's degree but before enrolling in the Graduate College may later be counted toward an advanced degree with approval of the Graduate College dean upon recommendation of the major department. A graduate student may not register for correspondence courses without the approval of the executive of his or her major department and of the Graduate College dean.

J. System of Course Numbers

Courses primarily for graduate students are numbered 200 or above in each department. Courses open to and carrying credit for both graduate and undergraduate students are numbered from 100 to 199. Courses below 100 are not accepted for graduate credit. Graduate credit may not be earned for taking courses numbered below 100 by registering in such courses as readings, special projects, or independent study having course numbers of 100 or above.

K. Auditing of Courses

Upon the recommendation of the instructor and the adviser, the dean of the Graduate College may grant permission to graduate students to audit courses for zero credit. Auditing is permitted only for a student who is currently registered.

L. Dropping of Courses

All graduate students who drop courses after the deadline date established by the dean of the Graduate College for each session and published by the registrar shall receive the grade of F unless the entire registration is withdrawn. This regulation may be waived by the Graduate College dean only on the recommendation of the Student Health director or the Student Counseling Service. If a student withdraws registration after the deadline date, the student must obtain permission from the dean of the Graduate College before being permitted to reregister.

Section III. Traveling Scholar Program

A. Purpose

The program, under the auspices of the Committee on Institutional Cooperation representing 11 universities in the Midwest, enables a doctoral student to take advantage of special resources available on another campus but not available on his or her own campus: special course offerings, research opportunities, unique laboratories, and library collections.

B. Procedure

1. A CIC Traveling Scholar first must be recommended by his or her own graduate adviser, who will approach an appropriate faculty member at the possible host institution in regard to a visiting arrangement.

2. After agreement by the student's adviser and the faculty member at the host institution, graduate deans at both institutions will be fully informed by the adviser and have the power to approve or disapprove.

3. A CIC Traveling Scholar will be registered at the home university, and fees will be collected and kept by that institution.

4. Credit for the work taken will be recorded at the home university.

5. Those desiring additional information should inquire at the office of the Graduate College.

C. Conditions

CIC Traveling Scholars will normally be limited to two semesters or three quarters on another campus. Each university retains its full right to accept or reject any student who wishes to study under its auspices.

Section IV. Academic Standing, Probation, and Dismissal

A. Nondoctoral Students

A student, except one on conditional status, shall be placed on probation if, after completing eight semester hours of graduate work, his or her cumulative grade-point average on graduate work done at The University of Iowa falls below 2.50. If, after completing eight more semester hours of graduate work at this University, his or her grade-point average remains below 2.50, he or she shall be denied permission to reregister; otherwise, the student shall be restored to good standing.

B. Doctoral Students

A doctoral student on regular status shall be placed on probation if, after completing eight semester hours of graduate work, the student's cumulative grade-point average on graduate work done at The University of Iowa falls below 3.00. If, after completing eight more semester hours of graduate work at this University, the student's cumulative grade-point average remains below the required level, the student shall be dropped from the program and denied permission to reregister unless he or she applies and is accepted for a nondoctoral degree or certificate program. If, after completing the second eight semester hours, the cumulative grade-point average is at least 3.00, the student is returned to good standing.

C. Restriction on Students on Probation

A student on probation shall not be permitted to take comprehensive or final examinations leading to any degree or certificate, nor may the student receive any graduate degree or certificate.

D. Departmental Regulations and Dissemination of Information

In addition to the above University-wide requirements, departments may establish further requirements which then determine the individual student's standing with regard to probation and dismissal. To this end, each department or program shall compile a written list of standards and procedures for work in that area. These documents shall be on file in each departmental office and the office of the Graduate College dean. Copies are to be available for students in the departmental office, and departments shall make all reasonable efforts to inform students. Subsequent changes in standards or procedures shall be communicated by the department to each student and the Graduate College dean. Whenever departments revise standards for a given program, the new regulations will not apply retroactively to the disadvantage of those already in the program. In addition to notifying students that they are subject to the rules of the Graduate College as set forth in the *Manual of Rules and Regulations*, any standards established by the department more stringent than the general Graduate College requirements shall be stated. Information shall be provided outlining required courses applicable to the various departmental programs of study, examination procedures and other formal evaluations, departmental policies with regard to awarding and renewing assistantships, time limits on programs of study, departmental registration policies, departmental grade-point requirements, requirements for changing from one degree program to another within the department—especially from the master's to the Ph.D.—departmental probation and dismissal policies and procedures (see "E" following), and other matters as are appropriate. The nature of the departmental advisory system shall be explained to the incoming students.

E. Academic Progress, Departmental Probation, and Dismissal Procedures

If a student is failing to meet departmental standards, the department shall warn the student of this fact in writing. The notification shall specify in what way(s) the student is failing to meet the standards. The student shall be provided a reasonable amount of time to meet the standards prior to departmental dismissal. If conditions such as conditional admission or probation are imposed, the department shall give at the time of its imposition written explanation of this status and its time limits.

A student who will not be permitted to reregister for failure to meet standards shall be notified of this fact in writing with reasons for the action provided. Such dismissal may follow failure to meet conditions of admission, conditions of probation, pre-announced departmental grade-point requirements or other standards, or failure of a regularly scheduled examination or formal evaluation. If a student judges the dismissal decision improper, the student has a right to review. Each department shall establish procedures for handling such reviews. The procedures are to be approved by the Graduate College dean, and shall afford a fair and expeditious review. A description of these procedures shall be included in the departmental regulations described above. (See "Section IV.D.")

F. Graduate College Review of Departmental Dismissal

Questions involving judgment of performance will not be reviewed beyond the department level. If, however, the student feels there has been unfairness or some procedural irregularity concerning dismissal, the student may request a review by the Graduate College. This review may be conducted by the Graduate College dean alone, or the dean may appoint a Graduate College committee consisting of both student and faculty members to conduct the review and recommend to the dean possible courses of action. The review by the Graduate College is final.

Section V. Credits

A. Transfer of Graduate Credit

Graduate work at other institutions will be entered on the student's permanent record by the registrar and a report of this action will be sent to the student and to his or her major department. Credit for these courses toward an advanced degree at Iowa must have the approval of the major department and the dean of the Graduate College.

B. Residence Transfer Credit

After admission to a departmental program in the Graduate College, residence graduate credit from another Iowa Regents' university may be counted as residence credit at this institution, provided such work is acceptable to the student's major department on the basis of the department's determination of its applicability toward the degree. (See "Section X.D." and "XII.C" for minimum semester hours required on campus for the master's and doctor's degrees.)

C. Reduction in Credit

For courses or seminars in independent study, thesis, and research, an instructor may report less credit than the number of semester hours for which a student is registered.

D. Graduate Credit for Veterans

Credit may be granted for studies pursued in war and military situations under such regulations as may be formulated by the national educational agencies and under such adaptation of standing rules as the Graduate Council may authorize from time to time to meet group or individual situations. The value of such credit in satisfying requirements for a degree will be determined by the major department with the approval of the dean.

E. Withdrawal of Registration and Proportional Credit for Students Entering Military Service

1. Students who leave within the first six weeks of the semester receive no credit.

2. Students who leave within the period of seven to nine weeks receive one-half credit.

3. Students who leave within the period of 10 to 12 weeks receive two-thirds credit.

4. Grade reports for the one-half and two-thirds credit periods: (a) Instructors report grades only as satisfactory or unsatisfactory. (b) Credit is to be assigned on the basis of total registration minus thesis and seminar. (c) Courses are to be counted toward specific degree requirements only after the student returns and then only with the department's approval.

5. Students who complete the twelfth week receive full credit.

6. Grade reports for the full credit period: (a) Grades are to be reported only at the end of the semester. (b) Credit is to be reported in specific courses.

7. In each instance the instructor reports the student's credit, grade, and date of withdrawal. No credit is granted unless the student's work is satisfactory at the time of leaving.

8. The amount of credit in thesis and research registration is to be reported to the registrar by individual instructors on the above basis except that less or zero credit may be assigned.

Section VI. Marking System

A. Marks Carrying Graduate Credit

These are A+, A, A-, B+, B, B-, C+, C, C-, and S—satisfactory.

B. Marks Carrying No Graduate Credit

These are D+, D, D-, F, I—incomplete, W—withdrawn without discredit, R—registered, and U—unsatisfactory.

C. Audit

R is assigned when a student registered for zero credit attends as an auditor throughout the course; if the student fails to meet the instructor's requirements for class attendance, W is assigned.

D. Incomplete

The grade of I is to be used only when a student's work during a session cannot be completed because of illness, accident, or other circumstances beyond the student's control. In registrations for thesis, research, or independent study, the satisfactory/unsatisfactory grades may be applied. (See next paragraph, "E".) Students who receive the mark of I must remove that mark within the first session of registration after the closing date of the session for which it is given, or else the grade becomes F, except that students with I's from the spring semester are exempt from completing the course during the succeeding summer session.

Specific deadlines for the submission of student work to the faculty and for the faculty's report on I grades to the registrar will be set by the Graduate College dean for each session and printed in the academic calendar. Courses may not be repeated to remove incompletes; removal of an I is accomplished only through completion of the specific work for which the mark is given.

E. Thesis, Research, Readings, Independent Study, and Special Projects

Grades of S and U may be used for registrations in thesis, research, readings, independent study, and special projects. S—satisfactory means that the student receives credit for the work; U—unsatisfactory means that he or she receives no credit. Neither S nor U is used in computing grade-point averages. At a later date, the instructor may change the S to a letter grade. In addition, departments may ask the Graduate College dean for permission to use grades of S and U as described above for courses which, because of their special or experimental nature, are judged to be more appropriate for such grading. In general, these requests may be granted for no more than one session and must be reviewed by the Graduate Council before being granted for longer periods. The type of grading system to be used in the above cases should always be mutually understood by the instructor and student.

F. Grades of S and U

S and U may be used for courses taken by a graduate student outside the major department or interdepartmental degree program provided that the instructor of the course and the student's departmental adviser approve the registration. Arrangements for satisfactory/unsatisfactory grading in these courses are accomplished by filing a card with appropriate signatures in the Registrar's Office at the time of registration, or no later than the last day of the third week of a semester or the third day of the second week of a summer session. No changes from letter grades to satisfactory/unsatisfactory grades or vice versa will be allowed after these dates.

It is not the policy of the Graduate College to abandon the traditional letter grades described in this section; however, in certain exceptional instances, departments having several areas of concentration involving widely differing types of effort may request the permission of the Graduate

Council to allow students majoring in one area to register in courses in another area within the same department or program on a satisfactory/unsatisfactory basis. In these instances, satisfactory/unsatisfactory cards will be used as described in the preceding paragraph.

G. Computed Grade-Point Average

This is based only upon graduate work graded A+ = 4.33, A = 4.00, A- = 3.67, B+ = 3.33, B = 3.00, B- = 2.67, C+ = 2.33, C = 2.00, C- = 1.67, D+ = 1.33, D = 1.00, D- = 0.67, and F = 0. Although a grade of A+ has a value of 4.33 in computing a student's grade-point average, the cumulative average is truncated so as not to exceed 4.00.

Section VII. Graduate Appointments

A. Scholarships

Scholarships are competitive and are awarded on merit.

1. Eligibility for graduate scholarships and fellowships will include: (a) registration in the Graduate College; (b) cumulative grade-point average of at least 3.00; (c) a GRE score or a GMAT score above a point to be designated by the Graduate College dean; (d) a satisfactory rate of progress in completing the program for the degree.

2. Preference will be given to candidates for the doctoral degree.

3. Recommendations for graduate scholarships may be made to the Graduate College by the appropriate department executive, director, or dean. A graduate scholarship may be awarded whether or not a student holds an assistantship. The amount of scholarship for the academic year may vary, but in no case exceed the comprehensive fee assessed. Scholarships will be credited to the student's University account.

B. Graduate College Fellowships

Fellowships are awarded by the Graduate College upon recommendation by departments to students with outstanding academic records. Fellows must be registered as full-time students. The primary purpose of the awards is to permit an advanced student to complete his or her dissertation or creative project and take the degree. Other terms of the award will be established by the Graduate College dean in consultation with the Graduate Council.

C. Faculty Research Assistantships

Faculty research assistantships are awarded to qualified graduate students and serve two purposes: to provide research service to professorial members of the academic staff and to provide apprenticeship experience for graduate students who are in training in research. Not more than 20 hours of service per week are required of a half-time assistant. Other part-time service is scaled in proportion, and a limited academic schedule is permitted (see "Section II.D"). Appointments ordinarily are made for the nine-month academic year, but appointments may be made for other periods of time by special arrangement. Stipends vary with the qualifications of the appointee and the amount of service rendered. Faculty research assistants appointed by the Graduate College pay their own fees. Graduate appointments beginning in August are usually made by the Graduate College dean upon recommendation of the various departments in March of each year, although applications may be considered at any time. Application should be made on the form provided by the Graduate College, and should be accompanied by recommendations and/or a letter summarizing the student's qualifications.

D. Graduate Assistantships

These assistantships serve two purposes: assistance in the instructional program of the University and the preparation of future college teachers. In order to achieve both aims, scholastically superior graduate students who show exceptional promise as teachers are selected for graduate assistantships. All appointments are made by the dean of the appropriate college on recommendation of the department.

E. Eligibility for Scholarships, Fellowships, and Research Assistantships

Scholars, fellows, and faculty research assistants on the Graduate College budget must be registered as regular students in good standing in order to hold such appointments. Appointments will be terminated when registration and/or student status is terminated. In no instance may a student be promised or tendered an appointment until after approval for admission to the Graduate College by the director of admissions.

F. Dismissal of Assistants

A uniform policy defining procedures to be followed in the dismissal of assistants has been approved by the Board of Regents. Copies of this policy are available in the office of the Graduate College dean.

G. Credit

No academic credit is allowed for the teaching or research service for which the student receives payment as a graduate or a faculty research assistant.

H. Loans

Graduate students requiring financial assistance may apply for loans at the Office of Student Financial Aid. See "Scholarships and Loans" section of the *Catalog*.

I. Other Forms of Support

Many departments offer financial assistance in the form of traineeships, part-time employment on research programs, or part-time teaching. Inquiries should be addressed directly to the major department.

J. Research Associateships and Postdoctoral Fellowships

These provide for independent research. Appointment is made through the Office of the Vice President for Academic Affairs.

Section VIII. Advanced Programs Offered in the Graduate College

The subject areas in which the Graduate College offers degree programs are listed under "Advanced Degree Programs" at the beginning of the "Graduate College" section of the *Catalog*.

Section IX. General Requirements for Advanced Degrees

A. Application for Degree

The student must file an application for an anticipated degree with the registrar not later than ten weeks after the start of the semester or one week after the start of the summer session in which the degree will be conferred. The student must have the application signed by his or her adviser. Failure to file the application by the deadline will result in postponement of graduation to a subsequent session.

B. Enrollment in Final Session

The student must be enrolled during the session in which the degree is to be conferred, except as noted in the following paragraph. Students who must register for the session in which the degree is to be conferred but are away from the University campus during that session may meet this requirement by registering for independent study, research, or thesis according to the practice in the various departments. Doctoral candidates who have completed all work except the final examination may register for the postcomprehensive registration described in "Section XII.K" if such registration is appropriate. Master's candidates who have completed all work except the final examination may register for 000:001 Master's Final Registration at a fee equivalent to the "postcomprehensive registration" if such registration is appropriate. Registration in a correspondence course will not satisfy this requirement.

Students completing all requirements (including the final examination and thesis deposit) for a graduate degree while enrolled in the Independent Study Session may receive their degrees in the following semester without additional registration.

Section X. Master's Degrees

A. Kinds of Degrees

Master's programs requiring a minimum of 30 semester hours lead to the Master of Arts degree, Master of Science degree, Master of Business Administration degree, Master of Comparative Law degree, Master of Arts in Teaching degree, and such other

master's degrees as are approved by the graduate faculty.

B. Plan of Study

The applicant for a master's degree must file a plan of study approved by the adviser and the departmental executive with the Graduate College within the session in which the degree is to be granted and by a date to be established by the Graduate College dean. The plan shall meet the requirements for the degree approved by the graduate faculty. (See also "Section IV.D. Departmental Regulations and Dissemination of Information.")

C. Major and Related Fields

The plan of study should provide for reasonable concentration in the major field of interest and, subject to the approval of the major department, may include related subjects from other departments.

D. Residence Requirement

Of the minimum of 30 semester hours required for the degree, at least 24 semester hours must be completed under the auspices of The University of Iowa, after admission to a departmental program in the Graduate College. Various forms of extramural registration may qualify toward fulfillment of this 24-hour residence requirement (see "Section II.G. Extramural Registration") in addition to regular on-campus registration. However, at least eight semester hours on campus are required, except for those departmental programs which ensure sufficient interaction between the students and the graduate faculty and have received approval from the Graduate Council and the dean of the Graduate College for reduction of this on-campus requirement.

E. Reduction of Old Credits

Credits for a master's degree dating back more than 10 years from the session in which the degree is to be conferred are not counted toward fulfillment of degree requirements. This rule may be waived by the dean in cases affected by military service.

F. Limit on Professional Courses

Work taken by a student in the Colleges of Dentistry, Law, or Medicine while enrolled for a professional degree may be credited to a graduate program leading to a master's degree if it is taken after the student has earned a bachelor's degree, or has completed work equivalent to that required for a bachelor's degree at The University of Iowa. The work accepted from the professional college must be directly related to the student's major field of study in the Graduate College and be approved as a part of the plan of study by the student's adviser and the major department. Work completed while registered for a professional degree in law, medicine, or dentistry will be counted as part of the residence requirement for nondoctoral degrees in the Graduate College only when the student is registered in an appropriate joint degree program.

G. Two Master's Degrees

The granting by this University of two master's degrees simultaneously or in succession requires the satisfaction of all requirements for each degree separately, including two theses where a thesis is required for each, and two examinations, with a minimum combined total of 60 semester hours of graduate credit.

H. Master's Degree with Thesis

Not more than nine semester hours of credit for thesis research and writing shall be counted in satisfying the 30-semester-hour minimum requirement. The thesis may be a scholarly study or an artistic production.

One copy of the thesis, complete and in final typed form, must be presented to the Graduate College for a check of formal characteristics not later than four weeks before the graduation date on which the degree is to be conferred. (See the Graduate College *Thesis Manual.*) After approval by the Graduate College and by the thesis committee, a final copy of the thesis must be deposited with the Graduate College not later than ten days before graduation.

The thesis committee shall consist of at least three members of the graduate faculty and may or may not be identical to the final examination committee. (See "K. Examining Committee.")

I. Master's Degree without Thesis

A master's degree without thesis, consisting of at least 30 semester hours of graduate study, may be awarded upon the completion of a curriculum prescribed by a department and approved by the Graduate Council.

J. Final Examination

The requirements for all master's degrees include a final examination which, at the discretion of the major department, may be written or oral or both. Such an examination will not duplicate course examinations. It will be evaluated by the examining committee as satisfactory or unsatisfactory, with two unsatisfactory votes making the committee report unsatisfactory. The report of the final examination is due in the Graduate College not later than 48 hours after the examination.

If the department so recommends, a candidate who fails the examination may present himself or herself for reexamination, but not sooner than the next regularly scheduled examination period in the following session.

The examination may be repeated only once.

Upon recommendation of a department, the comprehensive examination for a doctoral degree may be substituted for the master's examination.

K. Examining Committee

The examining committee for the master's degree consists of at least three members of the graduate faculty, appointed by the Graduate College dean upon recommendation of the major department or program, at least two of whom are from the major department. If the examination covers work in another department, one member of the committee must be from that department. Upon recommendation of the major department, the dean may appoint additional qualified persons (not necessarily members of the graduate faculty) to serve as voting members of the examining committee, and, at his or her discretion, the Graduate College dean may add a member to the committee.

Section XI. Two-Year Degrees

A. Master of Fine Arts Degree

This degree is awarded for creative work in the visual arts, dramatic art, music, dance, or literature. It is designed for students preparing themselves professionally in such fields as painting, design, mural decoration, sculpture, playwriting, acting, producing, stage design, musical performance, composition, instrumentation, choreography, poetry, fiction, and translation. Central to the program, the thesis may consist of a novel, a painting, a play, a musical composition, a dance performance, or any other approved artistic accomplishment.

The program for the Master of Fine Arts requires at least two years of residence credit in a graduate college. This requires a minimum of 48 semester hours of graduate credit, at least 24 of which must qualify for residence credit at this university. A Master of Arts degree may be earned while the student is working toward the Master of Fine Arts degree, but the student must meet all requirements for each degree separately, with a minimum combined total of 60 semester hours of graduate credit.

For other requirements see "Section X.B. Plan of Study"; "C. Major and Related Fields"; "E. Reduction of Old Credits"; "H. Master's Degree with Thesis"; "J. Final Examination"; and "K. Examining Committee."

B. Specialist in Education Degree

This degree is granted upon completion of a prescribed two-year, postbaccalaureate program designed for students preparing themselves professionally in such fields as teaching, administration and supervision, and special services.

Of the minimum of 60 semester hours required for the degree, at least 24 semester hours must be completed in residence at this University, of which 15 semester hours must be earned while the student is on campus within one 12-month period or during two summer sessions.

Twenty-eight of the 60 semester hours are prescribed in the area of specialization. The others are in cognate fields, supervised

experience, and electives. Four semester hours of research culminate in a written report.

Courses successfully completed ten or more years prior to the final examination will be evaluated by the major department in order to determine the amount of credit that shall be allowed for such work. Evaluation of such old credits will be reported to the Graduate College by the departmental executive at the time of submission of the plan of study.

Other requirements and regulations applicable to the educational specialist degree are the same as prescribed for the one-year master's degree in "Section X.B. Plan of Study"; "C. Major and Related Fields"; "F. Limit on Professional Courses"; "J. Final Examination"; and "K. Examining Committee."

A master's degree may be earned while in residence for the educational specialist degree provided the student meets all the requirements for the master's degree in question.

C. Master of Social Work Degree

The M.S.W. degree is conferred by the University upon those students who give evidence of knowledge and competence in the professional practice of social work by meeting the following requirements:

1. A minimum of 24 semester hours in residence at The University of Iowa;

2. A minimum of 60 semester hours in graduate social work, including a research requirement;

3. A final comprehensive examination, written or oral or both, covering all work for the degree.

The requirement of 60 semester hours may be interpreted to mean that a student who can satisfy the faculty of the school that he or she has accomplished, in the junior or senior undergraduate years, the clear equivalent of part or parts of the graduate curriculum in social work may be permitted, upon recommendation of the faculty of the school, to qualify for the M.S.W. degree on less than 60 semester hours. In no case may a student qualify for the degree on less than 45 semester hours of graduate social work study.

The curriculum is organized into four general areas: social work practice, human growth and behavior, the social services, and research. During the two-year graduate program, class work is combined with field practice in various settings. Since class work and field practice are arranged sequentially, students can enter the School of Social Work only in August.

For other requirements, see "Section X.B. Plan of Study"; "E. Reduction of Old Credits"; "F. Limit on Professional Courses"; "H. Master's Degree with Thesis"; and "K. Examining Committee."

Section XII. Doctor's Degrees

A. Character of Degree

The Graduate College awards two doctorates, the Doctor of Philosophy and the Doctor of Musical Arts. The doctorate is the highest degree awarded by the University. The Doctor of Philosophy degree indicates marked excellence in research or other creative work, and superior comprehension in the discipline. The Doctor of Musical Arts degree indicates marked excellence in performance and pedagogy.

B. Prerequisites

The candidate must present evidence of having completed a satisfactory amount of undergraduate work in the subject proposed for investigation or, in the case of deficiency, must register for prerequisite courses.

C. Residence Requirement

The doctorate is granted primarily on the basis of achievement rather than on the accumulation of semester hours of credit; however, the candidate is expected to have completed at least three years of residence in a graduate college. At least part of this residence must be spent in full-time involvement in one's discipline, at this University, beyond the first 24 semester hours of graduate work; this requirement can be met either by: (1) enrollment as a full-time student (nine semester hours minimum) in each of two semesters; or (2) enrollment for a minimum of six semester hours in each of three semesters during which the student holds at least a one-third-time assistantship certified by the department as contributing to the student's doctoral program. (For purposes of record and assessment of fees, student registration should reflect accurately the amount and kind of work undertaken in the Graduate College. All doctoral programs, including acceptable transfer credit, will contain a minimum of 72 semester hours of graduate work.)

D. Plan of Study

The development of a plan of study at the doctoral level is the responsibility of the student working together with his or her adviser. A formal plan of study must accompany the departmental request to the Graduate College for permission to conduct the comprehensive examination. The plan will provide a listing of all graduate courses taken which apply toward the degree and a listing of courses in progress or to be completed after the comprehensive examination.

E. Ad Hoc Interdisciplinary Programs

A student may prepare a proposal for an interdisciplinary course of study, including the plan for the comprehensive examination, under the sponsorship of at least three faculty members and the department most directly concerned, which shall be designated as the sponsoring department. Final approval of such individual programs is granted by the Graduate College dean, who may add members to the student's supervising committee from other closely related departmental faculties. The degree will be awarded in the interdisciplinary field stipulated in the approved program and, parenthetically, the name of the sponsoring department.

F. Reduction of Old Credits

Courses taken ten or more years prior to the comprehensive examination will be evaluated by the major department in order to determine the amount of credit that shall be allowed for such work. Evaluation of such old credits will be reported to the Graduate College by the departmental executive at the time of submission of the plan of study.

G. Limit on Professional Courses

Work taken by a student in the Colleges of Dentistry, Law, or Medicine while enrolled for a professional degree may be credited to a graduate program leading to a doctoral degree if it is taken after the student has earned a bachelor's degree, or has completed work equivalent to that required for a bachelor's degree at The University of Iowa. The work accepted from the professional colleges must be directly related to the student's major field of study in the Graduate College, and the plan of study must be approved by the student's adviser and the major department. Work completed while registered for a professional degree in law, medicine, or dentistry will not be counted as part of the one academic year which must be spent in residence as a doctoral student on the campus of this University.

H. Joint Program for Master's and Doctoral Degrees

Those students who expect to continue their training through the doctoral degree may file a joint program for the master's and doctor's degrees. The master's examination may be combined with the comprehensive examination for the doctorate for these candidates. The examining committee will file separate reports of its actions on the final examination for the master's degree and for the comprehensive examination. Upon recommendation of the department and approval of the Graduate College dean, students who are well qualified by previous training may submit a plan of study that leads directly to the doctoral degree without earning the master's degree as an intervening part.

I. Requirement in Foreign Languages

There is no general Graduate College requirement in foreign languages. Those departments which do require competence in one or more foreign languages establish standards as to the extent and level of competence, as well as methods of testing. Specific requirements will be found in the departmental statements of standards and procedures (see "Section IV.D."). Departmental executive officers are responsible for reporting completion of

requirements to the registrar for entering on the student's record.

Specifications of departmental requirements in foreign languages are filed in the Graduate College office and may be changed upon the initiative of the departments.

J. Comprehensive Examination

The candidate must pass a comprehensive examination, consisting of written or oral parts or both at the discretion of the major department. Admission to the comprehensive examination is granted upon the recommendation of the major department, the filing of the plan of study, and the approval of the dean of the Graduate College. A student must be registered in the Graduate College at the time of the comprehensive examination, which must be passed not later than the session prior to the session of graduation. This examination, administered only on campus, is intended to be an inclusive evaluation of the candidate's mastery of the major and related fields of study, including the tools of research in which competence has been certified.

The comprehensive examination is not a deferred qualifying examination. It is intended to evaluate the candidate's mastery of the subject at or near the end of his or her formal preparation and prior to the completion of the dissertation. The comprehensive examination and the final examination, which is concerned chiefly with defense of the thesis and related subjects, are the two principal examinations for the doctoral degree.

The comprehensive examination will be evaluated by a convened meeting of the committee and reported as satisfactory, satisfactory with reservations, or unsatisfactory to the Graduate College office within 14 days after the completion of the examination. Two "unsatisfactory" votes will make the committee report unsatisfactory.

In the event of a report with two or more votes of "satisfactory with reservations," the exact stipulations of the committee should be recorded with the report form. The statement must specify the time allowed for satisfying the stipulations and must be specific in defining the area if further examination in a particular area is required, or in describing any additional courses or other procedures that are required. The candidate will not be admitted to the final oral examination until such stipulations have been satisfied. The executive of the major department should promptly send a written report to the Graduate College giving the date of removal of "reservations."

In case of a report of unsatisfactory on a comprehensive examination, the committee may grant the candidate permission to present himself or herself for reexamination not sooner than four months after the first examination. The examination may be repeated only once, at the option of the department.

K. Postcomprehensive Registration

The student is required to register each semester after passing the comprehensive examination until the degree is awarded. If a student fails to register, the student may not be readmitted to candidacy until the student has submitted an application which has been approved by the student's adviser, the departmental executive, and the Graduate College dean.

All registrations should accurately reflect the amount and type of work undertaken, the use of University facilities, and the amount of consultation with the faculty. The student should register for the courses, research, and thesis necessary to complete the plan of study.

When the registrations required for the plan of study have been completed, the student may meet the continuing registration requirement by registering for 000:000 Ph.D. Postcomprehensive Registration and paying a special minimum fee for any semester in which the department (i.e., department chair or director of graduate studies) and the student's adviser determine that the student is neither making significant use of University facilities (except library privileges) nor partaking of consultation with the faculty. It is understood that no registration for a summer session is required when the student makes no use of University resources, unless the student is taking a degree at the end of that session or unless enrollment is required by the department.

L. Dissertation for the Doctoral Degree

One copy of the dissertation, complete and in final form, must be presented at the office of the Graduate College before the final examination, and not later than four weeks before the graduation date on which the degree is to be conferred.

Two copies of the approved dissertation must be deposited at the office at least ten days prior to the graduation date. The final deposit can be no later than the end of the semester (summers excluded) following the session in which the final examination is passed; failure to meet this deadline will require reexamination of the student.

Regulations regarding preparation of the dissertation copy shall be promulgated by the dean of the Graduate College. Dissertations will be microfilmed and thus made available on a permanent basis. An abstract of the dissertation, not to exceed 350 words of text, is to be deposited with the dissertation. The abstract must be approved and signed by the dissertation adviser. The abstract is published in the journal of *Dissertation Abstracts International.* One copy of the dissertation is bound and indexed at the University Library.

If the dissertation is in some nonprint form (e.g., painting, statue, performance in music) the librarian will help the student and faculty adviser work out an appropriate method of preparing the work, if such help is needed. Once the accompanying manuscript is accepted, it is treated the same as any other thesis.

Written dissertations shall be made available to all members of the examining committee not later than two weeks before the date of the examination.

M. Dissertation Fee

A nonrefundable dissertation fee is charged each candidate to cover the cost of processing the dissertation and abstract.

N. Final Examination

The work for the degree culminates in a final oral examination administered on campus. This examination should include: a critical inquiry into the purposes, methods, and results of the investigation—not a mere recapitulation of the procedures followed—and intensive questioning on areas of knowledge constituting the immediate context of the investigation.

The final examination may not be held until the next session after the student passes the comprehensive examination nor until the thesis is accepted for first deposit by the Graduate College; however, a student must pass the final examination no later than five years after passing the comprehensive examination. Failure to meet this deadline will result in a reexamination of the student to determine his or her qualifications for taking the final examination. The procedures to be followed are the same as those for the comprehensive examination. (See "XII.J. Comprehensive Examination.")

Final examinations for the doctorate are open to the public. Members of the faculty of the Graduate College are especially invited to attend and, subject to the approval of the chair, to participate in the examination.

The report of the final examination is due in the Graduate College office not later than 48 hours after the examination. The final examination will be evaluated as satisfactory or unsatisfactory. Two unsatisfactory votes will make the committee report unsatisfactory. In case of a report of unsatisfactory in the final examination, the candidate may not present himself or herself for reexamination until the next session. The examination may be repeated only once, at the option of the major department.

O. Examining Committees

The comprehensive and final examinations are conducted by committees of no fewer than five members of the graduate faculty appointed by the Graduate College dean upon recommendation of the major department, except that departments may request the dean's permission to replace one of the five members of the graduate faculty by a recognized scholar of professorial rank from another academic institution. A member of the graduate faculty from outside the major department is required in those cases where a related field outside the major department is

included in the comprehensive examination. For the final examination one member of the committee must be a member of the graduate faculty from outside the major department.

Upon recommendation of the major department, the Graduate College dean may appoint additional qualified persons (not necessarily members of the graduate faculty) to serve as voting members of the examining committees. A voting member may be added at the discretion of the Graduate College dean.

Section XIII. Exceptions

Petitions to waive these regulations may be made for appropriate and justifiable reasons on behalf of any graduate student through the departmental executive to the dean and the Graduate Council.

Courses

000:000 Ph.D. Postcomprehensive Registration **0 s.h.**

000:1 Master's Final Registration **0 s.h.**

000:111 Journalism in London at City University **arr.**
Full load of courses, some offered in conjunction with the City University of London. Internships may be arranged with the London news media. Open to advanced undergraduates and M.A. professional students. Offered spring semesters.

000:800 CIC Scholar **arr.**

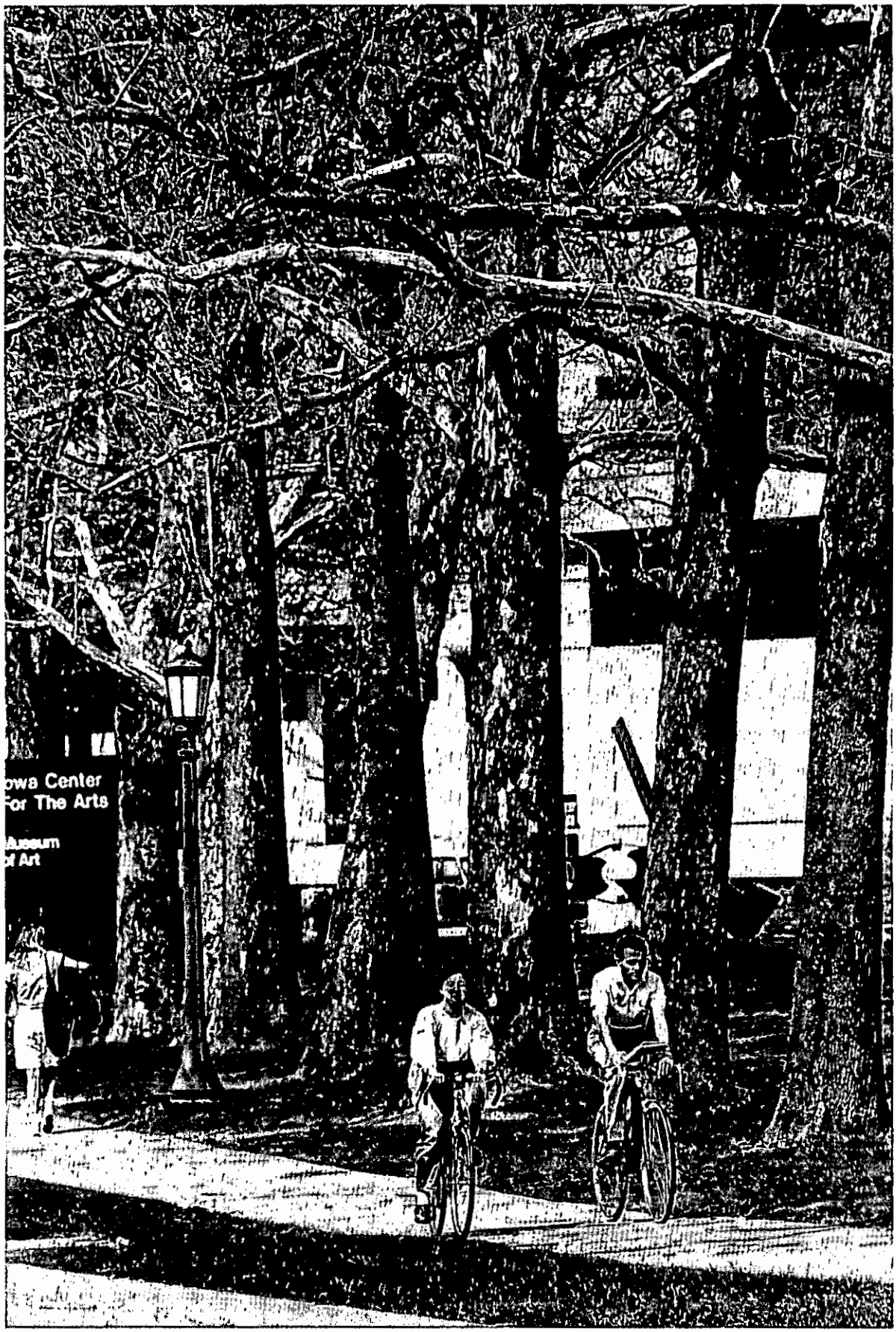
000:803 Iowa Liverpool Exchange Program **arr.**

000:806 Summer Program in Iceland **6 s.h.**
Lectures and field work on geological phenomena observable in Iceland (e.g., plate tectonics, rift and ridge features, volcanism); lectures on the history, physical, and human geography of Iceland. Offered summer semesters.

000:812 CIEE Paris Program **arr.**

000:999 Res/Fellow/Post-Doc **0 s.h.**

Exhibit preparation at the Museum of Natural History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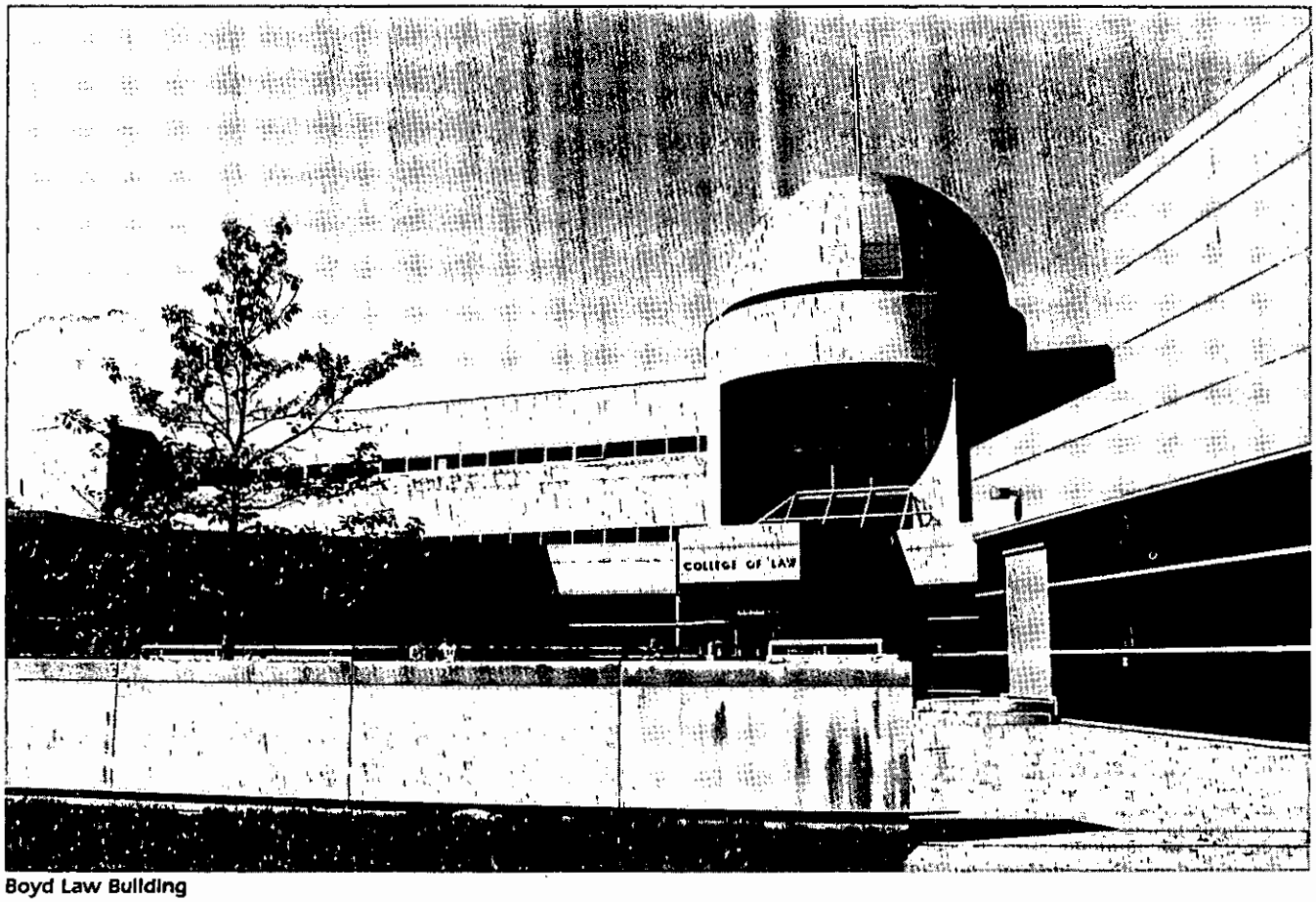


Boyd Law Building

Dean: N. William Hines, Jr.
Associate deans: Arthur E. Bonfield, Richard A. Matasar
Assistant deans: Lois K. Cox, Thomas C. Senneff
Professors: Eric G. Andersen, David C. Baldus (Joe B. Tye Professor), Patrick B. Bauer, Arthur E. Bonfield (John F. Murray Professor), Willard L. Boyd, Steven J. Burton, William G. Buss (O.K. Patton Professor), Jonathan C. Carlson, Martha E. Chamallas, Robert N. Clinton (Wiley B. Rutledge Professor), Mary L. Dudziak, Josephine Gittler, Michael D. Green, N. William Hines, Jr. (Joseph Rosenfield Professor), Herbert J. Hovenkamp, W.H. Knight, Kenneth J. Kress, Richard A. Matasar, Paul M. Neuhauser, John C. Reitz, Michael J. Saks, Peter M. Shane, John-Mark Stensvaag, James J. Tomkovicz, Lea S. VanderVelde, David H. Vernon (Allan D. Vestal Professor), Larry D. Ward (Aliber Professor of Law), Burns H. Weston (Bessie D. Murray Professor), Alan I. Widiss (Josephine R. Witte Professor), Gregory H. Williams

Associate professors: S. James Anaya, Peter D. Blanck, Enrique R. Carrasco, Barry D. Matsumoto, Gerald B. Wetlaufer, Adrien Wing
Clinical faculty: Patricia Acton, John S. Allen, Lois K. Cox, Reta Noblett-Feld, Paul Papak, Leonard A. Sandler, Barbara A. Schwartz, Randall S. Thomas
Lecturers: Nicholas Johnson, Philip A. Leff, Barry A. Lindahl, Darrel A. Morf, Amanda Potterfield, Anthony V. Sinicropi
Degrees offered: J.D., M.C.L.

Program Objectives

The objective of formal legal education is to establish a solid foundation for a lifetime of professional growth. The educational elements necessary to build this foundation are varied. For example, thorough familiarity with the substance of legal principles and the operation of legal institutions is an important component. The University of Iowa program places equal emphasis on developing fundamental lawyer's skills and an appreciation of the roles of law and lawyers in society. These objectives can be achieved best by an educational program that cultivates active student participation in the learning process and creates regular opportunities for individuals and small groups to confront challenging teachers who are genuinely interested in each student's professional development.

Professional skills development proceeds from an emphasis in the first year on careful reading, close analysis, legal research, argumentation, and clear, precise writing. Fact gathering, interviewing, counseling, drafting, transaction planning, negotiation, and litigation are among the skills emphasized in the second and third years. Iowa is unique in its commitment to the development of professional skills with full-time faculty in a small-group, individualized instruction format; many law schools rely heavily upon graduate assistants or adjunct instructors to teach these lawyer's skills.

The University of Iowa College of Law confers upon its graduates the degree of Juris Doctor (J.D.). To be eligible for the degree, students must satisfy the residence requirement, receive credit for 90 semester hours of course work, take and complete all required courses, achieve a cumulative weighted average of 65, and satisfy the college's five-unit research and writing requirement.

Program of Study

Full-Time Policy

The faculty believes that students receive a better legal education when they devote substantially all of their time to educational pursuits. For this reason, students are expected to pursue their law training on a full-time basis. This policy coincides with the accreditation standards of the American Bar Association and the Association of American Law Schools.

In extraordinary circumstances, it may be possible for students to enroll for fewer than 10 semester hours per semester. Students who believe they may be unable to attend on a full-time basis should contact the dean's office before registering for classes.

Options for Full-Time Study

The college offers two starting dates to entering students: late May (at the beginning of the summer session) or late August (at the beginning of the fall semester). Most students elect to enter law school in the fall and expect to graduate in May of their third year of study; these students also may attend summer school at any point during their careers.

A class of up to 45 students is allowed to enter law school in May of the year for which they applied. Students in the summer entering class complete nearly a full semester of work in the first 11-week summer session, and if they remain on the accelerated track by attending summer school in each subsequent summer, they can graduate nine months earlier than would otherwise be possible. Thus, the accelerated student who began law school in May 1988 may graduate in August 1990. Students who begin school in the accelerated program, however, are not required to continue in an accelerated track, but may switch to the regular three-year sequence of study.

Both the accelerated and regular programs consist of 90 semester hours of required and elective courses. All entering students are expected to take all courses designated as first-year courses and may not register for different courses or fewer semester hours without permission of the dean. No student may take more than 18 semester hours per semester or 13 semester hours in the summer session without permission of the dean.

Summer Session

The summer session consists of two periods of five and one-half weeks, during which six to eight upperclass and three to four first-year courses usually are offered. Nonaccelerated students may attend either or both periods. Accelerated students attend the entire 11-week session.

First-Year Small-Section Program

One of the distinctive benefits of legal education at The University of Iowa is the first-year small-section program, which integrates training in basic lawyer skills into substantive courses taught by regular, full-time faculty. The program's purposes include giving careful attention to development of each student's skills in legal analysis, argumentation, research, and writing.

In the fall semester (or summer session for accelerated students), the entering class is divided into sections of approximately 30 students. In the spring (or fall for accelerated students), each section contains approximately 20 students. The subject matter of the small-section courses varies from year to year but has included virtually every course in the first-year curriculum.

In the small-section course, students are given a series of challenging assignments, each with a different educational objective. Faculty members provide extensive critiques of student performance and discuss the assigned exercises both in class and in individual conferences.

First-year students receive one additional credit hour for their first-semester small section and two additional credit hours for their second-semester small section. A mandatory curve is applied to the grade distribution in all first-year courses.

Upperclass Program

In the second and third years, students have the opportunity to gain exposure to a broad array of substantive areas of the law; to concentrate course work or writing and research opportunities in particular areas of interest (e.g., through specialized courses and seminars); and to expand their training in oral and written advocacy skills, in interviewing and counseling, in negotiation, and in litigation. Very few requirements exist in the second and third years. All students must take 91:210 Appellate Advocacy I in the second year. Before graduating, all must take 91:232 Constitutional Law II and 91:308 Professional Responsibility.

Each student also must earn five writing credits in order to graduate. Students earn one of the credits automatically by satisfactory completion of 91:210 Appellate Advocacy I. They earn the remaining four credits through any combination of courses and activities that carry writing credit, including seminar papers, small-section drafting courses, independent research papers, *Iowa Law Review*, *Journal of Corporation Law*, 91:406-409 Legal Clinic, 91:412 Client Counseling Board, 91:402 Moot Court Board, and advanced appellate advocacy activities.

Legal Clinic

Students who have completed one-half of the work toward their J.D. degrees are eligible to participate in the College of Law Legal Clinic Program that offers opportunities for students to apply their theoretical knowledge to real cases under the supervision of faculty members and other attorneys. Clinic students participate fully in interviewing, fact investigation, pretrial discovery, negotiation, and courtroom proceedings.

Students in the clinical program represents distressed farmers in bankruptcy proceedings, inmates at Iowa correctional institutions in habeas corpus and civil cases, and other clients in a wide range of civil and criminal cases.

Students in the clerkship programs act as law clerks to trial court judges. They observe court proceedings, conduct research, and draft legal memoranda and court papers.

Finally, students in the externship program are assigned to work as legal assistants in a variety of state agencies and public interest law offices.

Students may earn up to a total of 15 semester hours of credit in the clinic program, although students taking courses in other schools or colleges of the University may receive no more than 20 semester hours of credit for such courses plus clinic.

In addition to those programs carrying academic credit, the College of Law participates each summer in the County Attorney Internship Program, through which students work as paid employees for county attorneys throughout the state.

Joint Law and Graduate Degree Program

The College of Law has developed programs with a number of departments of The University of Iowa Graduate College under which students simultaneously pursue degrees in both colleges. Under this program, if a student takes a course that is relevant to both degrees, the course can, within limitations, be counted toward the semester hour requirements of both programs, thereby reducing the time required to obtain the two degrees separately. It is hoped that joint degree students contribute to each discipline the insights and experience gained in the other.

Joint degree programs have been initiated with the graduate Departments of Accounting, American Studies, Anthropology, Business Administration, Computer Science, Counselor Education, Economics, Education, Educational Administration, English, Finance, Journalism and Mass Communication, History, Hospital and Health Administration, Industrial Relations and Human Resources, Library and Information Science, Music, Philosophy, Political Science, Religion, Sociology, Social Work, Spanish, and Urban and Regional Planning. Further information about joint degree programs is available from the assistant dean of the College of Law.

International Legal Studies

In keeping with its educational mission of encouraging the acquisition of both broad social awareness and technical professional competence, the College of Law offers a strong program of study in the rapidly expanding fields of international, comparative, and foreign law.

It does so essentially for three reasons. First, virtually any lawyer in this era of accelerating global interdependence may find herself or himself confronted by problems that require knowledge and understanding of international law and foreign legal systems. Second, as professionals and community leaders, lawyers often are called upon to influence, both directly and indirectly, the theory and conduct of United States foreign policy. And third, the study of international and comparative law, affording unique insight into the nature of law and legal process, helps to establish the necessary theoretical foundations upon which superior lawyering skills depend.

Master of Comparative Law Degree Program

The College of Law offers a one-year Master of Comparative Law (M.C.L.) degree to foreign-trained lawyers coming from outside the Anglo-American legal tradition. Candidates take a seminar that gives them a general orientation to the American legal system; they also write at least one substantial research paper. The balance of their course work is taken from the regular course offerings of the College of Law.

In recent years, graduates of this program have included lawyers from the Federal Republic of Germany, France, Italy, Lesotho, the Nationalist Republic of China, Pakistan, the People's Republic of China, the Republic of South Korea, and Thailand.

Major in International and Comparative Law

Students may elect to earn a J.D. degree with a declared major in international and comparative law. Fulfillment of the requirements for this program, which are greater than those for the ordinary J.D. degree, is recognized by special acknowledgment on the J.D. diploma.

The J.D. with major in international and comparative law ordinarily takes four years to complete. Students must successfully complete 120 semester hours of academic credit. Thirty must be concentrated in international and comparative law, with 8 of the 30 taken after successful completion of the 90 semester hours of academic credit required for the ordinary J.D. degree.

The prerequisite of 30 semester hours of concentrated work in international and comparative law must be satisfied by fulfillment of the following three requirements:

Successful completion of 22 semester hours of academic credit in international and comparative law, earned through required and elective course work in international and comparative law, approved study abroad, and up to 6 hours of approved non-law, graduate-level courses or approved work-study externships.

Successful completion of at least 4 semester hours of independent study, research and writing in international and comparative law, culminating in the completion of at least one paper of publishable quality; this requirement may be satisfied only after the successful completion of 90 semester hours of credit toward the ordinary J.D. degree.

Successful completion of at least 4 semester hours of independent study, directed reading in international and comparative law; this requirement may be satisfied only after the successful completion of 90 semester hours of credit toward the ordinary J.D. degree.

Students electing to earn a J.D. degree with declared major in international and comparative law are strongly encouraged to seek advice early in their law school careers from the chair of the program.

Student Life

There are currently 15 student organizations at the college, 3 student-produced scholarly journals, and 3 cocurricular programs, each managed by students, that offer specific skills training.

The University Environment

The law school is an integral part of the University, yet in some ways it remains a separate entity. It is located on the west side of the Iowa River, a five-minute walk from the main campus. The law building houses the school's administrative offices, auditorium, law library, bookstore, conference rooms, and classrooms. Names and faces quickly become familiar around the law school, helping entering students to become comfortable with their surroundings soon after school begins.

Law School Placement

The College of Law Placement Office provides career planning and job search assistance to students throughout their program of study. Each year the placement office sponsors a comprehensive series of informational programs on career options and job search skills. It also maintains a library of placement resources and provides opportunities for individual advising by professional staff. Job search assistance is also available to alumni.

A law degree from Iowa is a highly respected credential in the job market; Iowa graduates hold prominent positions on the bench, in the bar, in government, in business, and in education throughout the country. The special rigor that characterizes Iowa's distinctive brand of legal education attracts a wide variety and growing number of recruiters to campus each year. During the most recent academic year, representatives of more than 300 employers visited Iowa City to conduct job interviews, and many more firms used the college's placement office to search for prospective employees through written inquiries and off-campus interviews.

Iowa graduates have little trouble finding employment, and more than 90 percent are employed within a few months of graduation. The placement staff is happy to talk with prospective students regarding the college's programs and the success of its graduates.

Facilities

The Willard L. Boyd Law Building, completed in the spring of 1986, exemplifies

Iowa's continuing commitment to legal education and the legal profession. The large circular structure reflects the special character of the Iowa law school and allows the college to operate in a physical environment in which every square foot of space is designed to promote the college's academic and professional programs.

Classrooms in the new building provide an atmosphere conducive to the college's goals. They are air conditioned, carpeted, and properly lit. Small seminar rooms, the clinic suite, and special-purpose learning areas are distributed throughout the building to permit students and faculty to work together in close professional interaction. The largest classroom seats only 100 people. The student lounge, faculty lounge, and faculty offices are located on the same floor, encouraging interaction between the student body and faculty members.

Library

The centerpiece of the building is the law library, which houses the collection currently ranked eighth in size among university law libraries. The library occupies space on four floors and is one of the major legal repositories in the United States.

Iowa's collection exceeds 622,000 volumes and covers a full range of Anglo-American, foreign, international, and comparative law. The library's collection of early English legal source materials and its holdings of state documents are extensive. Since 1968 the library has been a selective Federal Documents Depository. An open-stack policy makes the collection accessible to all patrons. Students, faculty, and other users are served by a large and helpful staff of professional librarians.

Westlaw and Lexis/Nexis, computerized information retrieval systems, are available for training and research activities. WilsonDisk, a computerized CD-ROM and online data retrieval system, is available in the law library for accessing the *Index to Legal Periodicals, U.S. Government Documents,* and *U.S. Government Periodicals*. The Online Access System for Information Sources (OASIS) is the integrated computerized library system that provides information about materials in the collection and checks materials out of the library. The library uses RLIN, the Research Libraries Information Network, for on-line cataloging, catalog card production, and interlibrary loans. RLIN's law library program includes 17 of the major law collections in the country in addition to Iowa's, and the RLIN on-line database provides the ability to search the collections of these institutions extensively.

Financial Aid

A comprehensive financial aid program at the College of Law attempts to assist all students who need funds in order to attend school full time. However, since the financial resources of the law school are inadequate to subsidize the full cost of a legal education for every needy student, applicants and their families are expected to make a maximum effort to provide a reasonable portion of the students' expenses. Applicants are urged to contact the financial aid office at the college for further information about types of aid available.

Admission

Applicants for admission must have earned a baccalaureate degree from an approved college or university prior to commencing work in the UI College of Law. The services that College of Law graduates may be called upon to perform are so varied, and the possible fields of endeavor so broad and diverse, that the college prescribes no uniform undergraduate program for those planning to enter law school. With the assistance of faculty advisers, each student should develop an undergraduate program that explores and develops that student's particular intellectual interests.

Iowa strongly endorses the three basic objectives recommended by a committee of the Association of American Law Schools: education for comprehension and expression in words; education for a greater understanding of human institutions and values; and education for greater power in thinking. Anyone thinking of attending law school should keep these objectives in mind while planning an undergraduate course of study.

The association committee strongly emphasized that undergraduate education of students for a full life through liberal education is far more important than education directed too pointedly toward later professional training and practice. Students are urged not to sacrifice the broader perspective for detailed specialization.

Application Procedures

Applications may be obtained by writing to Director of Admissions, The University of Iowa, Calvin Hall, Iowa City, Iowa 52242. Students must file their application for admission by March 1 preceding the summer session or fall semester in which they want to enter. Applications should be returned to the director of admissions.

An evaluation fee of $20 must accompany each application unless the applicant's baccalaureate degree was/is to be conferred by The University of Iowa. This fee is nonrefundable except to residents of Iowa who are denied admission. Students from disadvantaged backgrounds who cannot afford the fee should apply for its waiver.

Applicants are responsible for submitting an official transcript from each college or university they have attended to the Law School Admission Services (LSAS), Box 2000, Newtown, PA 18940-0998. The College of Law should receive the applicant's Law School Data Admission Services (LSDAS) report prior to the March 1 deadline for submission of applications.

In the LSAT/LSDAS registration packet, applicants will find Law School Application Matching Forms. To preserve the right to privacy, LSAS has agreed not to release LSDAS reports to any school that does not furnish LSAS with a Law School Application Matching Form.

The University of Iowa cannot process an application without a Law School Application Matching Form. Therefore, applicants should attach or enclose the form with their application. Otherwise, processing of the application is delayed until the form is received.

Law School Admission Test

Applicants for admission must take the Law School Admission Test (LSAT) administered by the Law School Admission Service, Box 2000, Newtown, PA 18940-0998, and must have their LSDAS report forwarded to the College of Law. The test is given several times each year and may be taken at numerous locations in the United States and abroad. Applicants are urged to take the test during the fall preceding the fall or summer semester for which they are applying.

The last test that is considered by the admissions committee for the summer or fall first-year class is the test given in February. However, if the test is taken in February, it may put the applicant at a competitive disadvantage since it takes at least four weeks for the college to receive the results. February testers must have their applications on file with The University of Iowa prior to the March 1 deadline. Foreign student applicants whose native language is not English must take the Test of English as a Foreign Language (TOEFL), which is administered by the Educational Testing Service, Princeton, New Jersey 08540.

Deposit

Applicants accepted prior to April 1 are required to make an advance, nonrefundable deposit of $50 by April 1. Applicants accepted after April 1 must make the deposit within two weeks after being notified of favorable action on their applications. In either event, the deposit need not be made if a financial aid application is under active consideration. However, the deposit is due within two weeks after action is taken on the financial aid application. For those who enroll, the deposit is credited toward the first University bill. Applicants who fail to make the deposit within the time specified forfeit their place in the entering class.

Admission to the Iowa Bar

A rule adopted by the Iowa Supreme Court requires all law students who intend to apply for admission to the Iowa Bar to

register that intention with the court no more than 60 days after beginning law school. Details are available from the dean's office in the College of Law to students who register in the college, or from the clerk of the Iowa Supreme Court.

Courses

First Year

91:102 Introduction to Legal Reasoning 1 s.h.
Forms and interpretative methods of legal reasoning; problems of legitimacy; basic concepts and intellectual skills necessary for understanding the law.

91:104 Civil Procedure 2-5 s.h.
Subject matter jurisdiction, jurisdiction over the person, venue, pleadings, motion practice, summary judgment, simple joinder of parties and claims, pretrial discovery procedures, the trial, claim and issue preclusion.

91:116 Constitutional Law I 3-5 s.h.
Constitutional allocation of governmental powers; role of the courts in constitutional cases, powers of and relationships among branches of national government, and relationship between state and national governments.

91:120 Contracts and Sales Transactions I 3-6 s.h.
Purpose, scope, and development of protection accorded to contractual agreements; judicially developed rules; statutes governing formation, performance, and interpretation of contracts; remedies for breach of contract.

91:121 Contracts and Sales Transactions II 3-6 s.h.
Continuation of 91:120.

91:124 Criminal Law 3-5 s.h.
General justifications of punishment and fundamental common law; statutory principles of Anglo-American substantive criminal law, including mens rea, actus reus, mistake, strict liability, homicide gradation, attempt, complicity, intoxication, and insanity.

91:132 Property I 3-4 s.h.
The concept of private property as one of the basic foundations of our legal system; historical development of Anglo-American property law in conjunction with changing currents of economic, social, and political thought; emphasis on understanding decision making by courts in the common-law tradition.

91:136 Property II 3-5 s.h.
Continuation of 91:132; limitations imposed on the use of property by private agreement, common-law doctrine, and public regulations; relationships between law and other disciplines, particularly economics; constitutional protection of private property rights from governmental influence.

91:364 Torts A 3-4 s.h.
Development of the tort theories of negligence and strict liability, with emphasis on civil responsibility form harms to personal and property interests; roles of legislatures, judges, and juries.

Second and Third Year

91:000 Cooperative Education Internship 0 s.h.
Internships are administered by the Office of Cooperative Education and filled on a competitive basis by eligible students. Faculty approval and satisfactory completion of eligibility requirements required.

91:100 London Law Consortium arr.
Law study in London; cooperative venture between law schools at the UI and six other state universities. Offered fall semesters.

91:101 Program in Comparative Law/Bordeaux, France arr.
Four-week program of courses on international and comparative law taught in English by American and French professors; co-sponsored by the University of Bordeaux I; housing in Arcachon. Offered May-June. Application deadline: March 1.

91:125 Criminal Procedure 3-5 s.h.
Constitutional law; focus on Fourth, Fifth, and Sixth Amendment regulation of police investigatory practices, including searches and seizures, interrogation, undercover surveillance by informants, and identification lineups; exclusionary rules.

91:193 Human Rights in the World Community: Problems of Law and Policy 3 s.h.
Human rights, their moral and legal basis, their promotion and protection through governments and international organizations; comparative and international analysis of equality and nondiscrimination. Prerequisite: junior, senior, or graduate standing. Same as 47:193.

91:195 Introduction to Public International Law 3 s.h.
Principles of law that determine rights and duties of nations in their dealings with each other; contemporary international problems and controversies. Same as 47:195.

91:200 Accounting for Lawyers 2 s.h.

91:201 Antitrust: Legal and Economic Analysis 3 s.h.
Survey and economic analysis of American antitrust laws; focus on the law of monopolization, cartels, and mergers. Same as 6E:171.

91:202 Advanced Civil Procedure 3 s.h.
Complex civil lawsuits, especially multiple-party litigation; topics may include discovery, intervention, mandatory joinder, interpleader, class actions, appellate jurisdiction, and alternatives to litigation.

91:203 Administration of Estates and Trusts 2-3 s.h.
Income taxation and administration of estates and trusts. Not open to students who have had or are taking 91:203 or 91:269. Prerequisites: 91:272 and 91:378.

91:204 Administrative Law 3 s.h.
Formal and informal procedures, processes, and functions of state and federal administrative agencies, including legislative, executive, and judicial control of their actions.

91:205 Admiralty Law 1-2 s.h.
Admiralty jurisdiction; admiralty law of creditor's rights and personal injuries; laws pertaining to collisions and the law of salvage.

91:206 Advanced Criminal Procedure 3-4 s.h.
Constitutional and statutory rights applicable to formal criminal processes; topics include discovery and disclosure, bail, double jeopardy, speedy and public trial, press and public access, right to counsel, jury trial.

91:207 Advanced Antitrust 2 s.h.
Advanced treatment of selected subjects in antitrust litigation and jurisprudence.

91:208 Antitrust Law 3 s.h.
The law, history, and economics of federal regulation of competitive behavior, primarily under the Sherman and Clayton Acts; multifirm collaboration, monopolies, mergers, resale price maintenance, customer and territorial restraints, and related issues.

91:209 American Legal History Survey 3 s.h.

91:210 Appellate Advocacy I 0-1 s.h.
Students are assigned a fictitious case and must write an appellate brief asserting their client's position and argue the case before a panel of students, faculty, and attorneys from the community.

91:211 Appellate Advocacy II 1 s.h.
Continuation of 21:210 for second-year students who want more experience in appellate advocacy; increased complexity.

91:212 National Moot Court Competition 1 s.h.
Students participate as law schools' representatives in the Regional Moot Court Competition in fall of their third year, and judge intramural Moot Court Competitions in the spring semester. Open only to four finalists in Van Oosterhout Competitive version of 91:211.

91:213 Jessup International Moot Court Competition 1 s.h.
Second- and third-year students compete in intramural regional- and national-level moot court competition in the field of international law; intensive criticism in appellate brief writing and oral argument. Prerequisite: 91:210.

91:214 Bankruptcy Rehabilitations 2-3 s.h.
The means of rehabilitating the financial affairs of businesses and individuals available in proceedings under Bankruptcy Code Chapters 11, 12, and 13. Prerequisite: 91:244.

91:215 Children and the Law arr.
Children and the law; the law of child custody and proceedings, termination of parental rights and adoption, child abuse and neglect, and legal rights and responsibilities of parents and children.

91:216 Business Planning 3-4 s.h.
Problems involving common business transactions in the context of business planning and counseling; approximately one-third of the course devoted to related tax matters. Prerequisites: 91:241 and 91:272.

91:218 Federal Courts II 2-3 s.h.
Process of constitutional litigation; topics include federal habeas corpus, constitutional federal question jurisdiction, rights protected and relief available under 42 U.S.C. section 1983, justifiability, abstention, and the Eleventh Amendment.

91:221 Commercial Paper 3 s.h.
Statutory framework of commercial payment systems under Uniform Commercial Code Articles 3, 4, and 5; parallel developments in electronic payment and fund transfer systems.

91:222 Commercial Transactions 3-4 s.h.
Commercial and consumer transactions involving negotiable instruments and personal property security interests; emphasis on relevant provisions of the Uniform Commercial Code and of the Bankruptcy Code and consumer protection legislation.

91:223 Comparative Corporation Law arr.

91:224 Comparative Law 2-3 s.h.
Introduction to the comparative study of the world's main legal systems, with emphasis on the origins, development, and characteristic features of the civil law tradition, which includes most modern legal systems in today's world.

91:225 Community Property 1 s.h.
A survey of community property law in nine states—Louisiana, Texas, New Mexico, Arizona, California, Nevada, Idaho, Washington, Wisconsin—comparing and contrasting common-law property systems.

91:226 The Federal Regulation of Banking 3 s.h.
Existing and ideal role of regulation in facilitating economic growth and ensuring sound banking practices; market entry/expansion, bank and holding company supervision, deposit insurance/bank failure, and international banking.

91:227 Comparative Constitutional Law 2-3 s.h.

91:228 Conflict of Laws 2-3 s.h.
Problems created when a transaction or relationship has associations with more than one jurisdiction, emphasis on selection of the appropriate jurisdiction-selecting rules and on the recognition of judgments of other states; current evolution in the theoretical approaches to these problems.

91:230 Criminal Justice Reform arr.
Issues in criminal justice reform, including bail, prosecutorial discretion, plea bargaining, sentencing; crime commission reports, statutory reform proposals, social science and legal research and commentary.

91:232 Constitutional Law II 3,5 s.h.
Limits on government imposed by national constitution for protection of individuals; due process and equal protection of the laws; freedom of expression and association; religious freedom and the guaranty against establishment of religion.

91:241 Corporations I 3 s.h.
Structure and characteristics of both publicly and closely held corporations; distribution of powers among management, directors, and shareholders and fiduciary duties that limit those powers.

91:242 Corporations II 2 s.h.
Continuation of 91:241; emphasis on the law of securities regulation.

91:243 Federal Income Tax II 3 s.h.
Income tax treatment of corporations and shareholders, with emphasis on closely held corporations and their shareholders; for general practitioners or tax or corporation specialists. Prerequisites: 91:272 and 91:241.

91:244 Debtor Creditor Law 3 s.h.
Relationship between debtor and creditor and the rights of priority among creditors; mechanics of judgments, execution, levy, sale redemption, attachment, garnishment, and exemptions; bankruptcy, primarily Chapter 7 liquidations.

91:245 Corporations III 1-2 s.h.
Ad hoc studies of current materials centering on actual prospectuses, proxy statements, and tender-offer circulars, with emphasis on intrastate, registered, and unregistered offerings; practical implementation of corporate law.

91:246 Mediation 3 s.h.
Mediation skills; constructive conflict resolution, effective and efficient agreements.

91:248 Disability Rights 1 s.h.
History of social policy on disability and disability-based discrimination; status of people with disabilities in contemporary American society; disability rights under the Fourteenth Amendment; focus on rights protected under section 504 of the Rehabilitation Act of 1974. Offered May interim.

91:250 Employment Relations Law 3 s.h.
Rights of employers and employees in unorganized workplaces; legal issues that arise between employers and employees in the nonunionized setting.

91:251 Employees Retirement Income Security Act arr.
Overview of the basic act and its detailed implementing regulations. Prerequisite: 91:272.

91:252 Economic Analysis for Lawyers 2 s.h.
Skills development in fundamental techniques of economic analysis relevant to legal issues, including the economic theory of consumer behavior; theory of demand; nature of costs; theories of competition, monopoly, and oligopoly; role of the market; and resource allocation.

91:253 Employment Discrimination: The Law of Employment 2-3 s.h.
Legal prohibitions against discrimination in employment on the basis of race, sex, and national origin; major portion devoted to the study of Title VII of the Civil Rights Act of 1964; procedural and remedial problems and substantive issues.

91:254 Education Law 3 s.h.
Federal and state authority to govern public and private schools; rights of parents, teachers, and students; powers of legislators, judges, and educators; the interaction of law and education policy. Prerequisite: 91:232.

91:255 Environmental Law 2-3 s.h.
Introduction to the role of the legal system in addressing problems of environmental disruption, with special emphasis on air, water, and hazardous waste pollution.

91:256 Employment Discrimination: Proof of 2 s.h.
Theories underlying the principal claims of discrimination and defenses brought under major civil rights legislation and the Fourteenth Amendment; principal methods of proof used to establish these claims and defenses.

91:257 English Legal System arr.

91:258 Entertainment Law 1-2 s.h.
The entertainment industry, including the production, distribution, and retail sectors of its five branches: music, theater, movies, television, and print publishing.

91:260 Estate Planning Problems 2-3 s.h.
Problems in creating and implementing plans for the accumulation, conservation, and disposition of private estates; focus on effecting accommodations between estate owners' objectives, property law, and taxation.

91:264 Foundations of Anglo-American Law 3 s.h.
Development of English law from Henry II to Blackstone, mid-twelfth to mid-eighteenth century.

91:265 Evidence 3 s.h.
Rules of evidence developed in common-law courts and under statutes; judicial notice; examination of witnesses; privilege and competence; relevance; hearsay; burden of proof and presumptions; the roles of judge and jury.

91:267 Externship arr.

91:268 Family Law 3 s.h.
Creation and dissolution of marriage and parent-child relationships; lawyer's practical approach to family law problems combined with a broader view of how the law should treat those problems as a matter of sound policy.

91:269 Feminist Legal Thought 3 s.h.
Same as 131:269.

91:270 Federal Criminal Law 3 s.h.
Scope and limits of federal crimes in the context of federal offenses such as RICO, mail fraud, and drug offenses enforcement; state-federal relationships in the criminal law area.

91:271 Foreign Relations and the Constitution 3 s.h.
Treaty power, recognition power, war power, appropriations power as a check on executive activities; other separation-of-powers issues generated by the intersection of international and constitutional law.

91:272 Federal Income Tax I 3-4 s.h.
Operation, policies, and principles of the federal income tax, including gross income, deductions, property dispositions, tax accounting, and income shifting.

91:273 Federal Tax Practice and Procedures 2 s.h.
Administrative and court procedures with the Internal Revenue Service.

91:275 Federal Courts I 3 s.h.
History and structure of the federal jurisdiction; topics include Congress' power to control federal jurisdiction; federal question, diversity, admiralty, removal, and appellate jurisdiction; federal venue, service, and choice of law.

91:276 Foundations of the Common Law arr.
Legal and social changes in twelfth- through fifteenth-century England that formed foundations of common law: feudalism, property actions, extension of royal jurisdiction, criminal law, presentment jury, trial jury, Magna Carta, Parliament.

91:277 Fundamentals of Injury and Disease for Lawyers 2 s.h.
Medical problems arising in the context of worker's compensation, personal injury litigation, and criminal prosecutions.

91:278 Future Interests 1-3 s.h.
The common-law scheme of estates and future interests in real and personal property, both legal and equitable.

91:279 Government Contracts arr.
A practice area that raises significant public policy issues; special contract law created by the characteristic contract clauses in government contracts and the constitutional and administrative law controls of federal contracting.

91:280 Immigration Law 1 s.h.

91:281 Fundamentals of Appellate Procedures and Advocacy 1 s.h.
Introduction to the appellate process and skills required of an appellate lawyer.

91:282 International Business Transactions 3 s.h.
Legal problems that arise when private business transactions cross national borders; focus on the structuring of private international sales, investment, and licensing contracts to minimize the risks of conducting business on a global scale.

91:283 Copyrights 3 s.h.
The federal law of copyrights, primarily the Copyright Act of 1976; emphasis on copyright protections affecting new technologies such as videotape and computer hardware and software.

91:284 Insurance 3-4 s.h.
Legal principles and doctrines applicable to: insurance marketing arrangements; determining the persons and interests protected, the risks transferred, and when rights will be at variance with insurance policy provisions; the claims process; governmental regulations of the insurance business.

91:286 International Organizations 3 s.h.
International organizations and their role in multilateral dealings among states in the world community; emphasis on the United Nations and related agencies as forums for dispute resolution and the development of international legislations.

91:287 International Economic Relations 3 s.h.
National and international regulation of transnational economic relations; analyzes from the U.S. and international perspective issues such as legal problems concerning tariffs, export-import quotas, export licensing, Most Favored Nation clauses, national treatment of foreign exchange restrictions, balance of payment measures.

91:288 Jurisprudence 2-3 s.h.
Selected legal philosophies, with emphasis on legal postivism and natural law; topics may include the nature of jurisprudence, the relationship between law and morality, authority, normativity, the institutional nature of law, and political obligation. Same as 144:201.

91:289 International Commercial Arbitration: Law and Practice arr.

91:290 Juvenile Justice 1-3 s.h.
The problem of defining delinquent behavior, various causal theories, and measurement and extent of delinquency; the juvenile court system as a method of delinquency control; the failure of the juvenile court system to achieve its aims; alternative methods of delinquency control. Pre- or corequisite: 91:125.

91:292 Labor Law 3 s.h.
Federal law and its enforcement by judicial, administrative, and arbitral tribunals relating to unionized employees and private firms, including the rights of employees to organize and engage in concerted activities and collective bargaining.

91:293 Law in American History I 3 s.h.
Interdisciplinary study of American legal and social problems from early New England colonization until about 1880; lecture topics vary from year to year; readings from legal and nonlegal sources. Same as 16A:110.

91:294 Law in American History II 3 s.h.
Interdisciplinary study of American legal and social problems from around 1880 until the 1950s; lecture topics vary from year to year; readings from legal and nonlegal sources. Same as 16A:111.

91:295 Law and Economics 3 s.h.
Introduction to the field of law and economics; law examined through analytic tools of microeconomics; impact of legal rules on resource allocation, risk bearing, and distribution of economic well-being. Prerequisite: 6E:103 or consent of instructor. Same as 6E:172.

91:296 Law in Radically Different Cultures arr.
Three areas of law, crime, inheritance, and population in four cultures that are radically different from one another; western (California); eastern (People's Republic of China); religious (Egypt); traditional (Botswana). Prerequisite: junior, senior, or graduate standing.

91:298 Iowa Agricultural Real Estate Finance Law 1-3 s.h.
Selected aspects of state and federal law governing formation and enforcement of agricultural mortgages and land contracts.

91:300 Issues in Law and Philosophy 2 s.h.
Topics such as subjectivity and objectivity in law and in morals, theories of language, legal language, moral responsibility, legal responsibility, reasoning and legal reasoning. Same as 144:202.

91:301 Law and Political Process 3 s.h.
Federal constitutional and statutory law as it affects the power of citizens to choose and influence political officials; topics include voting rights, reapportionment and gerrymandering, vote dilution, and campaign financing and regulation.

91:303 The Law of Libel and Privacy 2 s.h.
Constitutional and common-law aspects of contemporary libel and privacy law; related issues of legal concern to journalists.

91:305 Law and Psychiatry 2 s.h.
Current medical concepts of mental disease and disorder; application of these medical concepts to legal problems such as commitments, civil and criminal, the right to treatment, confidentiality, "dangerousness," and the use of psychiatric testimony in criminal settings.

91:306 The Law of Electronic Media 2 s.h.
Introduction to legal and public policy issues in the operation and regulation of broadcasting, cable, and new technologies in an "information economy" that includes half of the nation's GNP and workforce. Prerequisite: junior or senior standing.

91:307 Legal Control of Sexuality and Sexual Conduct arr.
Legal regulation of sexual behavior, consensual and nonconsensual conduct; sexual harassment, homosexuality, rape, prostitution, pornography, and tort liability for harmful sexual conduct. Same as 144:209.

91:308 Professional Responsibility 1-3 s.h.
Public and private professional responsibility of lawyers, the organization of the profession, and its economics, ethics, and sociology.

91:309 Labor Arbitration 3 s.h.
Development of arbitration, legal and institutional aspects; effect of law on the arbitration process; concepts dealing with the rationale and purpose of arbitration relationship to grievance handling; contract administration, procedures and practices, and current issues. Same as 6J:259.

91:310 The Legal Imagination 2-3 s.h.
Rhetoric of legal discourse; literature of law compared to other literatures to discover how lawyers' and judges' modes of thought can be mastered and modified by the individual.

91:311 Introduction to Law: European Communities with Emphasis on Labor Law arr.

91:312 The Law and Sport 2 s.h.
Issues common to the law and business of amateur and professional sports industries; topics of current interest.

91:313 Legal Dimensions of the Farm Credit Crisis 2 s.h.
Selected legal aspects of current agricultural financial distress, including real estate finance mechanisms, security interests in personal property, unsecured debt enforcement procedures, debtor relief legislation and bankruptcy.

91:315 Legal Realism and Critical Legal Studies 2-3 s.h.
Two related but sometimes conflicting movements in American legal thought.

91:316 Legal Theory 3 s.h.
Nature and consequences of theory; variety of theories that bear upon law.

91:317 Legal Reasoning arr.
Recent theories, philosophical underpinnings; recent philosophical work on theory construction, knowledge, language, objectivity, and morality. Same as 144:205.

91:318 Mass Communication Law 2-3 s.h.
Selected issues relating to the role of the press in a free society; First Amendment theory; defamation; privacy; free press-fair trial; reporter privilege; and access to governmental information.

91:319 Native American Law 3 s.h.
The specialized body of law that has grown up around Native American peoples and their reservations; tribal self-government, jurisdiction, property tenure, hunting and fishing rights, and federal Indian policy. Same as 144:211.

91:320 Negotiations 2-4 s.h.
Extensive experience in simulated negotiations; detailed understanding of the negotiations process; focus on tension between effectiveness and integrity.

91:321 Alternative Dispute Resolution Methods 3 s.h.
Introductory survey of the theory and practice of nonadversarial dispute resolution.

91:323 Natural Resource Law 2-3 s.h.
Evolution of patterns of law in response to resource scarcity and social demands.

91:324 Patents and Intellectual Property 2 s.h.
The protection of ideas under the patent and copyright laws and the common-law of trade secrets; common-law and statutory protection of trademarks and trade names.

91:325 Law of Presidential Power 3 s.h.
Federal constitutional and statutory law as applied to the president and his principal advisers; focus on the president's roles as executor of the laws, chief administrator, foreign policy chief, and commander-in-chief.

91:326 Poverty Law 2 s.h.
Income maintenance programs; case law and legislative policy regarding poor persons.

91:329 Products Liability 2-3 s.h.
Negligence, warranty, and strict liability tort theories for personal injury, property damage, or economic loss caused by defective products; focus on the expansion of liability of manufacturers, sellers, and others.

91:331 Partnership Law and Taxation 2-3 s.h.
Federal income tax treatment of partners and partnerships.

91:332 Real Estate Transfer and Finance 3 s.h.
Modern real estate transactions, including problems of real estate brokers, land-sale contracts, mortgages, insurance, conveyancing practices, title examinations, financing techniques, and organization of real estate development ventures.

91:335 Race, Racism, and American Law 3 s.h.
Past and present aspects of race in public facilities, voting, housing, schooling, employment, marriage, and administration of justice. Prerequisite: junior, senior, or graduate standing. Same as 129:141.

91:340 Remedies 3 s.h.
Compares basic judicial remedies for redress of wrongs, unjust enrichment, and breach of contract; remedies include injunction, specific performance, restitution, and damages; effects of the merger of law and equity.

91:341 Rights of the Institutionalized 2-3 s.h.
Rights of institutionalized persons, including mail censorship, institutional conditions, discipline, free exercise of religion, and access to legal assistance.

91:345 Hard Cases: Science Policy and Values 2-4 s.h.
Major issues in practical ethics examined through difficult case studies in fields such as law, medicine, business, and politics; readings from classic authors such as Plato, Aristotle, Kant, and Mill; recent contributions from several disciplines. Same as 144:210.

91:347 Secured Transactions 3 s.h.

91:348 Securities Regulations 3 s.h.
Federal and state regulation of issuance of securities; the requirement that information be made available to the trading markets; tender offers and proxy fights for corporate control. Prerequisite: 91:241.

91:350 Sex-Based Discrimination 2-3 s.h.
Legal response to sex-based discrimination in the contexts of family, employment, education, and the criminal justice system; emphasis on substantive law; incidental treatment of procedure or remedies. Corequisite: 91:232.

91:352 Selected Real Estate Problems 2 s.h.
Real property title abstracts and some problems associated with real estate development and transfer; practice before planning and zoning commissions, financing of subdivision, and commercial development.

91:354 State and Local Government 3 s.h.
The allocation of decision-making authority in our society; principles and policies that underlie legal doctrines and the relationship of those principles and policies.

91:357 Social Science in the Law 3 s.h.
The use of empirical research in a wide variety of legal areas; how the law can best obtain, evaluate, and use such information; student skill development in methodology and statistics; the use of such knowledge to improve advocacy. Same as 144:203.

91:360 Taxation of Gratuitous Transfers 3 s.h.
Federal estate gift and generation-skipping taxes. Not open to students who have had or are taking 91:269. Prerequisites: 91:272 and 91:378.

91:361 Zoning Law and Practice 3 s.h.
Zoning, comprehensive planning, provision of services, subdivision development ordinances; mechanics of procedural devices. Prerequisite: 91:136.

91:362 Takeovers, Mergers, and Acquisitions 3 s.h.
Corporate acquisitions, emphasis on hostile tender offers; corporate law, securities law, tax law pertaining to acquisitions in general; special problems in hostile tender offers. Prerequisite: 91:241.

91:363 Trial Law and Practice 3 s.h.

91:367 Torts II 2-3 s.h.
In-depth examination of tort principles governing liability for civil wrongs other than breach of contract; theoretical basis, doctrinal development, and practical implementations of liability for harm caused by intentional and inadvertent behavior.

91:369 Trade Regulation 3 s.h.
Common-law and statutory business torts, aspects of government regulation of business; emphasis on trademarks and control of price discrimination under the Robinson-Patman Act.

91:370 Trial Advocacy 2 s.h.
Basic skills of trial advocacy; students learn particular aspects of trial technique and participate in a full trial. Prerequisite: 91:265.

91:371 Trial Advocacy Board 1-2 s.h.
Administration of the Trial Advocacy Program and Stephenson Competition; research and writing in connection with trial problems and readings used in program, and critique of performances of trial problems. Prerequisites: 91:265 and 91:370.

91:372 Stephenson Trial Advocacy Competition 1-3 s.h.
Presentation of at least two full trials by teams of two students; competition takes place in January; finalists represent the College of Law at a regional and national trial advocacy competition. Prerequisites: 91:370 and 91:265.

91:378 Trusts and Estates 3 s.h.
Transmittal of wealth within the family. Not open to students who have had or are taking 91:269.

91:400 Law Review arr.
Work on *Iowa Law Review*; staff and members of the board of editors may earn up to 6 semester hours of credit for their work on the publication.

91:402 Moot Court Board 1-3 s.h.
Members of the Moot Court Board administer the Appellate Advocacy Program, research the appellate cases used in the program, and judge appellate arguments; members are selected based upon their performance in 91:210-211.

91:403 Legislative Workshop arr.
Perspectives on the legislative process; major course project is drafting of proposed legislative action on a topic of contemporary significance.

91:406 Clinical Law Program—Internship arr.
Students work directly with faculty members on cases and in-house program; interns participate fully in interviewing, fact investigation, negotiation, and courtroom proceedings.

91:407 Clinical Law Program—Externship arr.
Students represent clients through legal assistance offices in eastern Iowa, under the supervision of faculty members and staff attorneys.

91:408 Clinical Semester arr.
Students spend a full semester on a clinical assignment away from the law school.

91:409 Clinic Seminar arr.

91:410 Client Counseling I 1 s.h.
Foundation for recognizing and resolving legal, nonlegal, and ethical issues in the legal interview; interviewing and counseling skills developed through practice sessions, lectures, and observation.

91:411 Client Counseling II 1 s.h.

91:412 Client Counseling Board arr.
Selected from successful participants in 91:410; board members coordinate the program and the Intraschool Client Counseling Competition under a faculty adviser and receive academic credit and compensation for their services.

91:415 Journal of Corporation Law arr.
Student-operated scholarly publication that examines subjects of current importance to businesses and the bar; staff members edit articles and write commentaries on suitable topics.

91:420 Transnational Law and Contemporary STUDIES Journal arr.

91:450 Supreme Court Day Problem arr.

91:500 Independent Research Project arr.
Independent research projects under the supervision of a faculty member for one or more semester hours.

91:504 Tutorial 1-4 s.h.
Tutorial under the supervision of a faculty member; may involve a substantive area of the law of jurisprudential ideas as they appear in various intellectual spheres.

91:605 Legal Aspects of AIDS arr.
Legal issues raised by the AIDS crises: education, employment, testing, housing, right to medical treatment, insurance, confidentiality; legal problems of institutions—schools, hospitals, military, prisons; problems of special groups—lesbians and gays, minorities, intravenous drug users.

91:606 Advanced Problems in International Business and Economic Relations arr.
Legal issues relating to trading and financial relationships among private parties and governmental actors from various nations; topics may include international antitrust, international discovery, international investment contracts, international debt, agricultural trade.

91:607 Capital Punishment arr.

91:610 Arms Control, Disarmament, and the Law arr.
Possible solutions to the nuclear arms race and the lawyer's role in relation to them. Offered fall semesters; writing credits available during spring semesters.

91:617 Comparative Administrative Law Seminar arr.
Creation and application of administrative regulations in England and the United States.

91:619 Comparative Environmental Law arr.
Environmental laws of England and the Common Market countries compared to American environmental law based on legislation and court decisions.

91:627 Courts and Social Integration Seminar arr.

91:628 Law and Mental Health Issues arr.

91:636 International Agricultural Trade Seminar arr.

91:639 Failed Banking Institutions Seminar arr.

91:640 Jurisprudence of Property and Community arr.

91:642 Inference, Probability, and Proof arr.

91:643 Freedom of Speech Seminar arr.
Philosophical foundations of freedom of speech—self-governance, pursuit of truth, self-realization, distrust of government; importance of these foundations in selected areas—national security, violence, commercial speech, obscenity, political spending, academic freedom.

91:645 Problems in International Law and Policy arr.
Current problems of international law and affairs; individual conference and group study bases, with emphasis on policy-oriented research and writing.

91:653 Law and Technology Seminar arr.

91:655 Law and Society: England 1500-1800 arr.
The discovery and demise of "fundamental law"; crime, juries, and criminal trial before the lawyers; uses, trusts, and the strict settlement of land; marriage, "divorce," and the legal rights of women; reshaping of the legal profession by businessmen.

91:656 Labor-Protective Legislation for Low-Paid Workers arr.

91:659 Law and Lawyers in Literature 1-3 s.h.
Fundamental societal issues and ethical questions considered through the discussion of literary works, including novels and plays by writers such as Camus, Coetzee, Dostoevski, Durrenmatt, Faulkner, Ibsen, Kafka, Melville, Schaffer, and Thucidydes. Same as 8:259.

91:660 Law, Medicine, and Public Policy arr.
Public policy issues that have both medical/health and legal aspects; focus on the changing legal framework for organization and regulation of health care. Same as 144:212.

91:661 Legal History Seminar arr.
Same as 144:206.

91:663 Law and Forensic Science Seminar arr.

91:666 Selected Topics in Banking arr.
Banking law problems analyzed in greater depth than in general survey course; students select areas of interest to research, write, and present to class members.

91:667 Modern Constitutional History arr.
Civil rights and civil liberties issues in American legal and cultural history from World War II to 1960; research paper required. Pre- or corequisite: 91:232 or consent of instructor. Same as 144:207.

91:668 Antitrust Law of Mergers and Joint Ventures Seminar arr.
Recent dramatic developments in the federal antitrust law of mergers and joint ventures; focus on history and assumptions of the new antitrust economics.

91:669 Selected Topics in Comparative Contract Law Seminar arr.
Civil law contract doctrine from Roman roots to French and German codes; 1980 United Nations convention on international sale of goods; compromise between civil and common-law rules.

91:670 Noneconomic Damages Seminar arr.
General damages questions: prejudgment interests—economic (lost income) and noneconomic damages (pain and suffering); damages issues in property and contract cases where the market does not provide adequate measure of damages (unique heirlooms); noneconomic damages in personal injury cases—pain and suffering, loss of amenities, loss of consortium; damages for dignitary and status injuries (defamation and discrimination).

91:671 Mass Toxic Disasters Seminar arr.
Modern mass toxic disasters, including asbestos, DES, Agent Orange; sociology of how such disasters occur, legal issues presented by toxic substances litigation.

91:674 Police Discretion arr.
Legal, political, and administrative problems in developing methods to control the exercise of police discretion; topics include general arrest decisions, use of deadly and nondeadly force, spouse and sex abuse.

91:675 Public Interest Advocacy Seminar arr.
Legal and strategic aspects of lawyering in areas of public interest; includes voting and other minority rights, environmental protection, community development, immigration, international human rights.

91:676 Self-Determinism Seminar arr.

91:677 Perspectives in Evidence and Procedure arr.

91:678 Professional Malpractice Seminar arr.

91:679 Tax Policy and Ethical Problems in Tax Practice arr.
Tax policy and reform.

91:685 Lying by Lawyers and Their Clients Seminar arr.
Legal, ethical, moral, and provisional constraints on concealment, deception, equivocation, misrepresentation, and inaccurate statements by attorneys or their clients.

91:695 Theories of Tort Law arr.
Economic, philosophic, and empirical scholarship on tort law; emphasis on arguments attempting to justify current tort law or to improve it by prescribing alternatives.

College of Medicine

Dean: John W. Eckstein
Senior associate dean: Carol A. Aschenbrener
Associate dean, academic affairs: Rex Montgomery
Associate dean, continuing medical education: Richard M. Caplan
Associate dean, medical student affairs and curriculum: Charles M. Helms
Associate dean, Veterans Affairs: John E. Kasik
Assistant dean, administration and finance: William L. Lillibridge
Consultants to the dean: Woodrow W. Morris, Paul M. Seebohm
Assistant to the dean: Richard K. Schmidt
Degrees offered: B.S., M.A., M.D., M.P.T., M.S., Ph.D.

The College of Medicine, as an integral part of the University, contributes to the educational programs of several thousand students, not only those in the health Colleges of Dentistry, Medicine, Nursing, and Pharmacy, but also in the life sciences areas of the College of Liberal Arts and the health-related programs of other colleges. Additionally, it serves health professionals from throughout the Midwest who take part in a year-round program of continuing medical education, in which several thousand practicing physicians update their knowledge and skills through refreshers, short courses, clinics, and conferences each year. It also expands and maintains educational opportunities in outreach health centers of the state, and it provides a statewide educational health care resource.

Beyond its academic responsibilities as the only college in Iowa that offers work toward the M.D. degree, the College of Medicine is concerned with broad public issues of distribution and organization of health care services. Its faculty members advise and serve on state and regional health planning councils, health boards, and various health agencies; some faculty also take part in the University's Center for Health Services Research.

The College of Medicine is responsible for the associated medical sciences programs of education for physician assistants, medical technologists (with tracks in cytogenetics, perfusion, and biotechnology), physical therapists, and nuclear medicine technologists.

Medical and associated medical science students have several opportunities to gain first-hand experience in physicians' offices and community hospitals. For medical graduates, the college offers seven family practice-affiliated residency programs in six cities throughout the state. The college promotes and sponsors experimental programs that demonstrate methods of organizing health services at the local level.

Accredited by the Liaison Committee on Medical Education of the American Medical Association and the Association of American Medical Colleges, The University of Iowa College of Medicine meets the requirements of all state licensing boards. Its diploma admits the holder to all privileges granted to graduates of all medical colleges before such boards. All other professional programs administered by the College of Medicine are accredited by their respective accrediting bodies.

Faculty

Nearly all College of Medicine faculty members are full-time, their work in practice and research being part of—not apart from—their work in teaching. Many have earned national and international honors.

Graduate Programs

The college offers programs leading to graduate degrees through the Doctor of Philosophy in anatomy, biochemistry, microbiology, hospital and health administration, human nutrition, pharmacology, physiology and biophysics, preventive medicine and environmental health, and radiation biology. In addition, graduate degree programs leading to a master's degree are offered in pathology and physical therapy.

Medical Scientist Training Program

An interdisciplinary M.D.-Ph.D. program offered jointly by the College of Medicine and the Graduate College, the Medical Scientist Training Program provides preparation for careers in medical science and academic medicine with emphasis on research and teaching. With support from the National Institutes of Health, the program integrates the requirements for doctoral training in sciences basic to medicine with the full clinical requirements of the medical curriculum. The program entails six to seven years of study. Further details are given in the program description.

Combined M.D.-Master's Degree Programs

Students who want to pursue the M.D. degree in combination with a master's degree program must gain admission to both the College of Medicine and the Graduate College and must make detailed arrangements with the graduate department chair and the associate dean for medical student affairs of the College of Medicine.

Interdisciplinary Programs and Centers

Interdisciplinary programs and centers have been developed that draw strength from the faculty of the college and the facilities available to them, without regard to their departmental units or to the separation of graduate and postgraduate training. Notable among these are the interdisciplinary programs in endocrinology and immunology, in which degrees are not offered; students determine emphasis through appropriate selection of a study program. Further information can be obtained from the associate dean for academic affairs.

The following centers are subdivisions of the College of Medicine.

Center for Health Services Research

The Center for Health Services Research (CHSR) has been the research division of the Graduate Program in Hospital and Health Administration since 1981. It is the University-wide focal point for a broad-based program of health services research.

With the coordination and support of the CHSR, faculty and staff from colleges and departments throughout the University investigate the organization, delivery, efficacy, and financing of health care services.

CHSR interests embrace a broad spectrum of perspectives and disciplines, including economics, geography, organizational behavior, psychology, operations research, sociology, preventive medicine and environmental health, preventive and community dentistry, nursing, and clinical medicine. Through its research activities, the center promotes links among health organizations throughout the Midwest. CHSR also fosters frequent exchanges with professional and provider associations, policy and planning groups, insurance organizations, health delivery institutions, and other members of the health services research community.

As the driving force behind formation of the Health Services Research Consortium, the center has developed affiliations with the Veterans Affairs Health Services Research and Development Field Program, the Mercy Consortium for Health Services Research, and the National Institute for Rural Health Policy.

Clinical Research Center

The Clinical Research Center provides the setting for patient-oriented research of disease processes. Studies of normal human physiology and biochemistry also are conducted. The center is a discrete unit with its own beds, patients, and nursing staff and is financed by federal monies, enabling faculty members to conduct carefully supervised studies that could not be accomplished with equal precision by drawing upon the resources of existing beds at the affiliated hospitals.

Mental Health Clinical Research Center (MHCRC)

The major emphasis of the MHCRC is the study of schizophrenia. The center provides the facilities for research linking the clinical picture of the illness with its underlying neurobiology. The seven research units of the MHCRC conduct the necessary integrative and interdisciplinary research to advance the knowledge of the disease.

Cardiovascular Research Center

The Cardiovascular Research Center coordinates research and training programs related to cardiovascular diseases and encompasses the following federally funded programs: Program Project Grant on the Regulation of the Circulation in Pathological States, the Specialized Center of Research in Arteriosclerosis, Specialized Center of

Research in Ischemic Heart Disease, Specialized Center of Research in Occupational and Immunologic Lung Disease, Program Project Grant on Cerebral Blood Vessels, Juvenile Hypertension Program, Lipid Research Clinic Trial, several training programs, and a coordinated program of other interdisciplinary research supported by a number of individual project grants. Gifts from private donors have underwritten construction of two floors of cardiovascular research laboratories and administrative offices on top of the Medical Research Center.

Diabetes and Endocrinology Research Center

The Diabetes and Endocrinology Research Center coordinates research and training programs related to diabetes and associated endocrinologic diseases. It was established in 1979 with support from the Institute of Arthritis, Metabolism, and Digestive Diseases.

Cancer Center

A Cancer Center was established in 1980 to coordinate the efforts of University of Iowa faculty and staff in research, education, and demonstration programs related to all aspects of cancer.

Alzheimer's Disease Research Center

This center studies Alzheimer's disease and related neurological conditions from the viewpoint of neuroanatomy, neuroimaging, neuropsychology, and neurochemistry. The center's purposes are to improve the diagnosis and treatment of these conditions, to disseminate information on new research to the public, and to contribute to a better understanding of the neural basis of cognition.

Educational and Patient Care Facilities

First- and second-year classes are taught in the Bowen Science Building and the Medical Laboratories.

The Hardin Library for the Health Sciences is a vital resource centrally located on the medical campus.

Students acquire clinical experience in the 902-bed University of Iowa Hospitals and Clinics complex, in the adjacent 327-bed Veterans Affairs Medical Center, and in a score of affiliated hospitals and ambulatory care centers throughout the state.

Faculty members of the Colleges of Medicine and Dentistry make up the 493-member clinical staff at The University of Iowa Hospitals and Clinics, whose 16 clinical services are directed by the heads of the corresponding academic departments in those colleges. These faculty members also provide instruction for the 624 resident physicians and dentists who make up the house staff of the hospitals and clinics, where facilities are provided for teaching all major medical specialties, for residencies in all such specialties, and for fellowships in a number of subspecialties.

The University of Iowa Hospitals and Clinics serve as a tertiary care center for the state of Iowa and portions of adjoining states, with most patients being referred for care and treatment not readily available in their home communities. For details about The University of Iowa Hospitals and Clinics, Veterans Affairs Medical Center, and related academic and health service units, see "The University of Iowa Health Center" in the Special Resources at Iowa section of the *Catalog*.

Research Facilities

The Eckstein Medical Research Building, opened for occupancy in early 1989, was designed to provide flexible research space that rapidly adapts to the changing needs of interdisciplinary research activities. The facility serves interdisciplinary groups of faculty scientists, each of whom is researching a human biology problem at the advancing edge of science, and enables them to conduct research in close proximity to other select researchers. In order to accomplish this, the facility's laboratories have been designed to accommodate a wide range of research. The spaces, mechanical systems, and available support services offer the greatest flexibility and adaptability for current and future research.

In addition to the functional laboratory suites, specialized research facilities contain highly specialized one-of-a-kind equipment or environments. The facilities support researchers working in the building and others working on biological research outside of the building.

A number of facilities that support the research and teaching endeavors of College of Medicine faculty are administered through the dean's office. University of Iowa research facilities housed in the College of Medicine include the Facility for Protein Structure Studies, Electron Microscopy Facility, and a Computer-Assisted Image Analysis Facility. (See "Research Activities" in the Special Resources at Iowa section of the *Catalog*.)

The animal care unit arranges for the purchase, housing, and veterinary care of a wide variety of animals. The unit also is responsible for investigator training in the use of research animals and for compliance with all laws relating to animal research.

The bioengineering facility provides specialized electronic design, construction, and repair services.

The Iowa University Affiliated Facility, a unit of the Division of Developmental Disabilities Department of Pediatrics, provides interdisciplinary training, exemplary services, technical assistance, and information dissemination and participates in research to enhance the quality of life for persons with developmental disabilities. Professionals from many disciplines (e.g., audiology, dentistry, education, family practice, pediatrics, nursing, nutrition, occupational therapy, physical therapy, psychology, leisure studies, social work, speech-language pathology, and rehabilitative engineering) work together as teams to provide short-term tertiary evaluation and treatment in support of community services for persons with developmental disabilities.

The Office of Consultation and Research in Medical Education is made up of education specialists in a broad range of areas who serve the faculty, staff, and administration. The office provides educational consultation, initiates and cooperates in educational research endeavors, and conducts faculty development activities.

The medical instrument facility designs and fabricates scientific equipment and provides precision machine services and custom signage.

The medical graphics, photography, and television sections offer consultation, design, and production services in these various art forms. The spectrum of composition is greatly expanded by Genigraphics, a computer-generated graphics system.

The P3 facility meets federal guidelines for recombinant DNA research requiring P3 containment. It also can be used for research on other biohazardous human or animal pathogens.

A facility for mass spectrometry provides service for the qualitative and quantitative identification of important biological molecules.

The Tissue Culture Hybridoma Facility provides tissue culture media for tissue culture. It prepares cell fusions to form hybridomas from which monoclonal antibodies are isolated. The Flow Cytometry Facility provides facilities, technical personnel, and consultation services to investigators studying diverse problems in cell biology, immunology, endocrinology, hematology, cell physiology, and cell kinetics. The flow cytometer will measure any optically detectable cellular property.

Doctor of Medicine

The University of Iowa College of Medicine accepts 175 freshman students each year into its four-year course of study leading to the Doctor of Medicine (M.D.) degree.

The curriculum in medicine at the University is based on a strong tradition of excellence. It is evaluated and renewed continually to reflect the changing needs of the new physician and of society.

Basic Medical Sciences (First Three Semesters)

The first three semesters present a core of sciences basic to the study of medicine.

First Semester

- 99:163 Biochemistry for Medical Students is centered around a series of clinical situations. The language of this discipline is presented in the context of problems the physician will meet. In the small-group discussions that follow the clinical series, students start to use various problem-solving approaches.
- 60:103 Gross Human Anatomy for Medical Students includes clinically relevant areas of anatomical radiology and surface anatomy with clinical correlations. A complete dissection of the human body is undertaken, and the relationship to the living system is stressed.
- 60:104 Medical Embryology offers lectures on human embryology, with emphasis on the clinical aspect of development. Registration is limited to medical students; graduate students are referred to 60:217. The course is offered fall semesters.
- 60:105 General Histology for Medical Students provides a course of study for the core information concerning cellular and tissue structure and function needed for the work to be accomplished in physiology and pathology.
- 115:102 Human Dimensions in Medicine is designed to introduce medical students to the importance of communication in the practice of medicine and to increase awareness of personal and social values. The course provides students with small-group experience through which they learn about and improve their ability to communicate sensitively with patients and colleagues.
- 63:110 Biostatistics provides guidelines for the application of statistical principles to the biological and medical sciences. Emphasis is given to the interpretation of studies published in medical journals.

Second Semester

- 72:212 Medical Physiology offers students an understanding of responses that an organism gives to external stimuli and provides a basis for understanding the integrated function of organ systems. Much of the material in these two courses is presented from a clinical point of view. In small discussion groups, which have essentially replaced laboratory exercises, students present their evaluations of the physiologic mechanisms at work in the clinical material. Some demonstrations are used.
- 61:103 Medical Microbiology includes immunology and presents a core of information on the classification and mode of action of infectious agents, as well as certain aspects of body response to these agents. Laboratory work plays an important role in this course.
- 50:234 Medical Neuroscience is an integrated course dealing with basic principles of neurophysiology and neuroanatomy, with emphasis on the human central nervous system. The laboratory primarily involves the anatomical study of spinal cord and brain.
- 69:201 General Pathology for Medical Students is correlated with microbiology in this semester to increase efficiency of the learning process. Emphasis is placed on pathogenesis and altered function in cellular and tissue degeneration, infection, and growth disorders. Clinical problem solving and discussion periods have replaced laboratories in this course.

Third Semester

- 69:202 Systemic Pathology for Medical Students applies the principles given in the previous semester to specific diseases in an organ system approach. Student-centered learning is fostered by discussion groups and practice in case analysis.
- 63:109 Preventive Medicine presents fundamentals to help prepare students in some of the sociologic, economic, and public health aspects of medical practice.
- 71:105 Pharmacology for Health Sciences: Medical bridges the clinical and basic sciences and provides students with principles that must be understood in order to describe properly the actions of drugs in patients.
- 50:165 Biomedical Ethics covers ethics vocabulary, the processes of moral reasoning, and illustrative problems increasingly prevalent in modern medical work. Several elective courses are available to students during the third semester. These carry 2 semester hours of credit. Topics include areas not specifically covered in the regular curriculum and areas related to medical practice and the role of the physician. Typical examples are Perspectives in Aging, Humanistic Medicine, Human Nutrition, and Spanish for Health Professionals.

Introduction to Clinical Medicine (Fourth Semester)

A major interdisciplinary course, 50:111 Introduction to Clinical Medicine, fills the fourth semester. It includes participation by a large proportion of the faculty and is vital in providing students with the tools for a lifetime of patient care.

The first series of mornings is devoted to introducing the patient as a person and giving guidance in interviewing, counseling, and history taking. Following this is an intensive review of clinical medicine on an organ system basis, presented by teams of clinicians and basic scientists. The final group of mornings is spent in areas of medicine that do not fall naturally into organ systems, and on reemphasis of some key subjects.

Throughout the 16 weeks of the course, students spend afternoons acquiring and practicing the clinician's skills in history taking and physical examination. Habits of care, concern, and compassion needed by all physicians are established in this semester. Toward the end of the semester, each student is evaluated individually several times to determine the level of skill achieved. If further work is needed, guidance and assistance are provided.

Clinical Clerkships (Third Year)

The third year includes the required clinical clerkships and presents students with opportunities to work with physicians of almost all disciplines as they care for their patients. Students spend nine weeks in internal medicine; six weeks each in surgery, pediatrics, psychiatry, and obstetrics and gynecology; and two weeks each in anesthesia, dermatology, neurology, otolaryngology—head and neck surgery, orthopaedic surgery, urology, and family practice. Students spend most of this time in Iowa City except during the family practice clerkship, which exposes students to primary care in a physician's private practice somewhere in Iowa.

The clinical clerkship year is the most critical period of time in medical education, for it is when students take on the posture of physicians to learn first-hand the complexity of medical science when viewed at the bedside, and to understand the physician's responsibility for human life.

Period of Selective Study (Fourth Year)

Following the clerkships, the fourth year provides a period of selective study, giving students many options. The broad, comprehensive orientation to the different medical disciplines and the level of clinical sophistication achieved during the clerkship year qualify students to participate in a variety of medical experiences, ranging from advanced courses in specialty areas to community-based clerkships in primary care. All students must complete a required course in clinical pharmacology and therapeutics.

Financial Aid

The College of Medicine provides financial assistance on the basis of demonstrated financial need. Most aid is in the form of loans. The Health Professions Student Loan and Guaranteed Student Loan are federally funded or sponsored programs. The Medical Education Assistance Program, Carroll Brown Medical Student Loan, and Sledd Loan are College of Medicine programs. The Dr. George Scanlon Medical Student Loan is available to Iowa residents through the Iowa Medical Foundation of the Iowa Medical Society.

A limited number of grants are awarded each year to students who demonstrate exceptional need.

In certain situations, small, short-term emergency loans may be obtained through the college.

Information and advising on financial aid can be obtained through the Office of Student Services, College of Medicine.

Educational Opportunities Program

The Educational Opportunities Program provides financial and academic assistance to disadvantaged students from groups that are underrepresented in American medicine: Black Americans, Mexican-Americans, Native Americans, and Mainland Puerto Ricans.

Admission to the M.D. Program

The College of Medicine participates in the American Medical College Application Service (AMCAS), a nonprofit centralized application processing service for applicants to U.S. medical schools. Preliminary applications are processed by AMCAS beginning June 15 of the year preceding the beginning of the class for which application is being made. Prospective students are urged to apply as early as possible. The closing date is December 1.

Final application will be forwarded to applicants whose AMCAS applications pass a review conducted by the College of Medicine. A $20 fee must accompany the final application from applicants who have not completed work in residence at The University of Iowa. This fee is not refundable except to residents of Iowa who are denied admission.

Admitted applicants also must file with the University Office of Admissions an official transcript from each college attended.

Requirements

Applicants for admission to the College of Medicine must have received the baccalaureate degree, or have completed three years of a curriculum qualifying them to receive the baccalaureate degree after completing the first year in medicine, or have completed three years of a baccalaureate program meeting the general graduation requirements of the college they are attending.

Prospective students must have earned at least 94 semester hours of credit, or the equivalent, including:
Physics: a complete introductory course;
Mathematics: college algebra and trigonometry, or advanced college mathematics for applicants who completed college algebra and trigonometry in high school;
Chemistry: at the minimum, a complete introductory course in organic chemistry, ordinarily following a complete introductory course in modern general chemical principles; and
Biological sciences: a complete introductory course in the principles of animal biology, or zoology and botany (not botany alone), and an advanced biology course.

All the foregoing must be taken with appropriate laboratories.

Applicants for admission to the College of Medicine must possess the capability to complete the entire medical curriculum and achieve the Doctor of Medicine degree. The medical curriculum requires demonstrated proficiency in a variety of cognitive, problem-solving, manipulative, communicative, and interpersonal skills. Therefore, candidates admitted to the College of Medicine must be able to:

- Observe demonstrations and experiments in the basic sciences;
- Learn to analyze, synthesize, and solve problems and to reach diagnostic and therapeutic judgments;
- Adequately use the senses of vision and hearing and the somatic sensation necessary to perform a physical examination;
- Perform palpation, auscultation, and percussion;
- Relate reasonably to patients and establish sensitive, professional relationships with them;
- Communicate the results of the examination to patients and to their colleagues with accuracy, clarity, and efficiency;
- Learn and perform routine laboratory tests and diagnostic procedures;
- Display good judgment in the assessment and treatment of patients;
- Learn to respond with precise, quick, and appropriate action in emergency situations;
- Accept criticism and respond by appropriate modification of behavior; and
- Show the perseverance, diligence, and consistency to complete the medical school curriculum and enter the independent practice of medicine. Applicants who may not meet these standards are encouraged to contact the coordinator of admissions.

Fulfillment of the specific requirements for admission does not ensure admission to the College of Medicine. From applicants meeting the requirements, the admissions committee of the College of Medicine selects those who appear to be best qualified for the study and practice of medicine.

Applicants who have completed the baccalaureate degree and required courses five or more years before seeking admission to the College of Medicine are considered by the admissions committee only under exceptional conditions.

To be considered for admission, applicants must have attained a grade-point average of at least 2.50 for all college work undertaken. Where courses are available on a graded or pass/fail basis, it is expected that applicants will have taken the required science courses for a grade.

Preference is given to applicants with high scholastic standing who are residents of Iowa. Consideration is also given to outstanding nonresidents.

Applicants are required to take the Medical College Admission Test administered by the Association of American Medical Colleges no later than the fall of the year preceding that for which they are seeking admission. Students may arrange to apply for this examination through the University's Evaluation and Examination Service.

Personal interviews are not usually conducted but are occasionally requested by the admissions committee. Applicants who feel that an interview is necessary may request that one be arranged by contacting the coordinator of admissions. Requests for interviews normally should be made before January 1. The specific purpose of the interview should be clearly stated.

Applicants accepted on or prior to February 15 must submit a $50 advance payment by March 1. Applicants accepted after February 15 must submit this payment within two weeks after they receive notification of acceptance. The advance payment is credited toward tuition and fees.

All students entering the College of Medicine are required to comply with the pre-entrance and periodic health screening program developed by the Student Health Service in cooperation with The University of Iowa Hospitals and Clinics.

Promotion Policies and Procedures

Promotions Committee

The purpose of the promotions committee is to ensure that each person who graduates from The University of Iowa College of Medicine has adequate skills, knowledge, judgment, ethical standards, and personal integrity to assume the responsibilities of a medical doctor. To perform its duties, the committee depends on the cooperation, advice, and judgment of faculty, students, and administration.

The promotions committee consists of six members and the associate dean for medical student affairs ex officio (without vote). There are five faculty members, one of whom is designated by the dean to serve as chair. Two are from two basic science departments, and three are from three clinical departments. There is a medical student member from either the junior or senior class. The dean of the College of Medicine makes faculty appointments to the committee after consulting with the executive committee, and appoints the student member after consulting with the

medical student council and the chair of the committee.

Regulations and Procedures

In general, promotion from one grading period to the next is contingent upon the satisfactory completion of the courses of each grading period. It is the prerogative of the promotions committee to permit a student who has not satisfactorily completed courses in a preceding grading period to continue, provided that an appropriate tutorial program is designed for that student. Each student must demonstrate proficiency in each required course.

Evaluation of student progress in courses is based on examinations or other tests as determined by each department or course and on clinical skills and competency as deemed appropriate by the department or course. The College of Medicine requires that all students demonstrate proficiency in a variety of cognitive, problem-solving, manual, communicative, and interpersonal skills and insists that all students adhere to general principles of medical ethics. These critical skills and ethical guidelines are described in detail in the *Handbook for New Students*, which medical students receive upon matriculation.

Scholastic performance in the first three years is reported by using the letters H, P, F, and I. In the selective studies segment, only grades P, F, and I are used. The letter P indicates satisfactory achievement at the passing level. The letter H signifies "honors," indicating achievement at an exceptionally high level. The letter F indicates work below the passing level. The letter I is used when, for good reasons, the student has not completed the work in a course.

The promotions committee meets at least three times each year, following the completion of each academic semester and at other times as requested by the associate dean for medical student affairs.

The committee reviews with the course directors the records of all students who have received a grade of F or I during the previous grading period. The committee reviews the record of any student presented by the course directors committees or the associate dean for medical student affairs as doing continually poor academic work, or failing to demonstrate proficiency in any of the eleven skills or abilities detailed above, or not meeting the medical ethics standards. The committee considers other business or procedures as deemed necessary to perform its duties as set forth in this charge.

The promotions committee recommends specific actions to be taken in the case of any student whose skills, knowledge, judgment, or ethical behavior is in any way considered consistently marginal or unsatisfactory. These recommendations are forwarded for action to the medical council and executive committee, meeting in joint session to represent the faculty. Possible recommendations include immediately dismissing the student from the college, requiring the student to repeat all or any part of the curriculum, and allowing the student to continue either a regular or a decelerated schedule.

Students having unremediated grades of failure are placed on academic probation. A grade of incomplete, if not remediated in the time and manner specified in the promotions committee recommendation, becomes a grade of failure. Students who are on probationary status may be considered for dismissal if further academic difficulties arise.

The promotions committee presents all recommendations for awarding the degree, Doctor of Medicine, to a joint meeting of the medical council and executive committee, which act on the recommendations for the faculty.

Medical students are not permitted to drop courses after the deadline established by the dean of the College of Medicine unless they have received the dean's permission. Students who receive permission to drop a course after the deadline receive a grade of W unless the entire registration is canceled. Students who drop a course without obtaining the dean's permission receive a grade of F unless the entire registration is canceled.

Relationship to Course Directors Committees

The course directors committees provide guidance and counseling for students and act as a resource for and provide advice to the promotions committee.

Appeals

Students who want to appeal promotion decisions must submit an appeal in writing to the dean of the College of Medicine within two weeks after the date of written receipt of the decision. All appeals are heard, and decisions rendered, by the medical council and executive committee meeting in joint session. Students may request an opportunity to appear personally before the joint session to make a statement and to answer questions.

Leave of Absence

The College of Medicine believes that certain students may benefit from being granted a leave of absence from the college for specified periods of time. A leave of absence should be requested from the associate dean for medical student affairs. Leaves are granted at the discretion of the dean.

All leaves must be arranged in advance of the student's absence. Students who request that a leave begin during a clinical clerkship or clinical elective must obtain permission from the course director.

Any unexcused absence from a major section of a basic science course or a clinical clerkship may result, at the discretion of the department, in a grade of F.

Withdrawal

Students may withdraw from the College of Medicine upon approval of a written application submitted to the office of the associate dean for medical student affairs.

Reinstatement

Application for reinstatement by students who have withdrawn voluntarily or who have been required to withdraw from the college must be received in writing in the office of the dean at least four months prior to the requested date of readmission.

The faculty is authorized to refuse continued or further registration to any student if it believes that he or she has not lived up to the expected general fitness requirements for entering the medical profession, as described in detail in the *Handbook for New Students*. Ordinarily, such action is taken by the medical council and the executive committee meeting in joint session and acting as representatives of the faculty.

Informal Procedures

When a dispute arises between a student and a faculty member or department, there is often confusion over the best way to resolve the problem. The medical school has a formal procedure, stated in "Promotion Policies and Procedures," and an informal procedure, outlined below.

In the College of Medicine, students with problems or complaints should first attempt to resolve the issue with the faculty member involved. Lacking a satisfactory outcome, students then should turn to the course or clerkship director or departmental chair or head. If satisfaction still is not obtained, they may discuss the complaint informally with the associate dean for medical student affairs of the College of Medicine. This informal discussion does not necessarily lead to involvement of the office of the dean in an official capacity. Should these steps not resolve the situation, the student may file a formal complaint through the office of the dean of the College of Medicine.

This informal procedure allows the greatest flexibility for all concerned in resolving conflict and does not involve entries in the student's permanent record, which are part of the formal procedure. The informal procedure is intended for any situation students may encounter, including grading disputes, alleged academic dishonesty, alleged dishonesty during clinical rotation (e.g., falsifying patient data), and perceived incidents of discrimination or harassment. Complaints of sexual harrassment are handled confidentially and in accordance with University Policy and Procedures.

When students are in the process of resolving a complaint with a faculty member or department, others should try to avoid jumping to conclusions based on rumors and bits of information. In the interest of the student's confidentiality, full details of incidents are almost never released to the medical student body.

Students are encouraged to make full use of counseling services available from the dean's office or through Student Health Service. These cover the full range of academic, personal, financial, or marital difficulties and usually are handled informally without going into the student's record, unless it involves an official action (e.g., taking a year off or rescheduling an exam) or academic matter.

Division of Associated Medical Sciences

The division offers a B.S. degree in medicine. (The M.P.T. and M.A. degrees offered by the Physical Therapy Program, the Ph.D. offered in cooperation with the Department of Exercise Science in the Division of Physical Education, and the M.S. Physician Assistant Track in Preventive Medicine and Environmental Health are offered through the Graduate College and are subject to its policies.)

General Policies

Advising

When students declare their intended major to be one of the programs in the Division of Associated Medical Sciences, they are assigned to that program for academic advising.

Admission

Students are admitted to the College of Medicine at the time of formal admission to one of its programs. Admission policies and procedures vary from program to program. The Physician Assistant and Nuclear Medicine Technology programs have an early admission process.

Students should consult the individual program descriptions and/or program offices for details of the admission processes. Students may be admitted as degree or nondegree candidates (special students). Nondegree candidates are subject to College of Medicine rules for academic probation and dismissal.

To be considered for admission, applicants must have earned a cumulative grade-point average on all college work attempted as appropriate to each program: medical technology, 2.60; nuclear medicine technology, 2.50; and physician assistant, 2.50. Admission committees give special attention to grades in the sciences, particularly those prerequisite science courses required by the individual programs. The cumulative or science grade-point average for the last 60 semester hours may be used to satisfy the minimum grade-point average requirement, at the discretion of the program admission committee.

Student Health

Students admitted to division programs must show proof that they have had a recent physical examination including routine laboratory procedures and immunizations for their own and their patients' protection before they enter the program. These records are maintained through Student Health Service, which should be consulted for further information.

Financial Aid

Students in the Division of Associated Medical Sciences undergraduate programs are eligible to apply for undergraduate financial aid. Scholarships, grants, loans, and part-time job placement are administered by the University's Office of Student Financial Aid and are awarded on the basis of demonstrated need. Part-time work in related areas is sometimes available.

Graduation Requirements for Baccalaureate Degrees

General Requirements

Students must earn a minimum of 124 semester hours of credit. The number required after admission to a specific program varies from program to program. Students should consult the program description and/or program director for more specific information.

The general requirements for graduation include quality as well as quantity of work completed. Candidates must earn a minimum grade-point average of 2.00 in all college work attempted, all work undertaken at The University of Iowa, and all graded work attempted after admission to the College of Medicine. Students enrolled in a program that uses the pass/fail/honors grading system must pass all courses required to complete the program.

The residence requirement may be met by earning the final 30 consecutive semester hours in residence, or 45 of the last 60 semester hours in residence, or an overall total of 90 semester hours in residence.

Nonresident instruction includes course work at other colleges and universities, course work in other undergraduate colleges at The University of Iowa, and all work by correspondence, including University of Iowa Guided Correspondence Study courses.

General Education Requirements vary from program to program. Students must check the requirements of the specific program or degree objective. Specific requirements for the major are listed in each program description.

Double Majors

Students may earn more than one major in the College of Medicine by meeting the requirements for each major.

Two Baccalaureate Degrees

Students who want to earn two baccalaureate degrees, each from a different college, must do so under a combined degree program and must have their combined course of study approved by the dean of the College of Medicine and the dean of the other college.

Second Baccalaureate Degree

Students who already possess a baccalaureate degree and who want to earn an additional bachelor's degree must complete at least 30 consecutive semester hours in the College of Medicine. Students who hold a B.A. or B.S. degree will be considered to have satisfied all General Education Requirements for graduation except the foreign language requirement. Holders of other degrees must meet college and program degree requirements. Students with B.A. or B.S. degrees must satisfy the residence requirement for a bachelor's degree at Iowa. Candidates for a second bachelor's degree must apply for the degree through the Office of Admissions.

Combined Baccalaureate Degree Program

Students may earn two University of Iowa baccalaureate degrees in a combined curriculum program in the Colleges of Medicine and Liberal Arts. Although students begin their academic program in the College of Liberal Arts, they must be eligible for admission to College of Medicine baccalaureate programs in medical technology, nuclear medicine technology, or physician assistant.

Students who select this program must meet requirements specified by both colleges. Candidates in the combined program usually are able to meet the baccalaureate degree requirements of both colleges in about five academic years. The exact length of time necessary to complete the program is determined by the major areas of study selected in each college. Students who enter the combined degree program are assigned two faculty advisers, one in the major department of the College of Medicine and the other in the major department of the College of Liberal Arts.

Candidates in the combined degree program must satisfy all requirements for both degrees. They must complete an overall total of 154 semester hours of credit, including at least 30 semester hours of courses offered by the College of Medicine and at least 30 semester hours of courses offered by the College of Liberal Arts.

Students interested in the combined degree program should see the director of the baccalaureate program of their choice in the College of Medicine.

Minors

Students graduating from the College of Medicine may earn a minor or minors in any degree-granting department or program in the college outside of their major department or in another college of the University by meeting that department's requirements for the minor. In general, a minimum of 15 semester hours must be taken in the minor.

Application for Degree

Students who want to be considered for graduation must file an application for degree with the Office of the Registrar before the deadline for the session in which the degree is to be conferred. Students who want to have a minor listed on their transcript must indicate this on the degree application form so that completion of the requirements for the minor can be verified.

Duplication

Duplication occurs when students take the same course more than once or when they take a course that duplicates the content of a satisfactorily completed course. Regression occurs when students take a more elementary course after having satisfactorily completed a more advanced or higher level course in the same subject. Duplication and regression are assessed by the registrar at the time of graduation analysis. Hours earned by duplication or regression do not count toward the number of hours needed for graduation.

Graduation Honors

Approximately ten percent of the division's graduating students may be recognized for their scholastic achievement upon recommendation by the program and with the dean's approval. Minimum criteria have been established for the following designations: distinction, high distinction, and highest distinction.

Registration and Grading

Students are not allowed to register after the third week of the semester or the first one and one-half weeks of the summer session. The maximum permitted registration is 20 semester hours in a regular semester and 10 in the summer session. Students must obtain permission from the head of the division to register for more than the maximum semester hours allowed.

Changes in Registration

Courses may be added with the signatures of the adviser and the course instructor at any time during the first one-fifth of the course. They may be dropped at any time during the first two-thirds of the course. Approval is required from the head of the division for all other changes in registration and is granted only in extraordinary circumstances. Students are assigned a mark of W (withdrawn) for any course dropped after the first one-fifth of the course.

Students who have registered for courses offered for variable or arranged credit may change the number of semester hours with the signatures of the instructor, the adviser, and the head of the division at any time prior to the end of the first two-thirds of the course.

Other changes in registration (such as to audit for 0 credit) may be made only during the first one-fifth of the course.

It is the student's responsibility to see that the change of registration form is approved by the necessary individuals and delivered to the Registration Center. Changes in registration become effective on the date the completed form is submitted to the Registration Center.

Withdrawal of Registration

Students may withdraw registration without academic penalty at any time prior to the end of the first four-fifths of the course, but no credit is given for the course. Later withdrawal results in automatic assignment of an F. Students who withdraw are not reinstated after the deadline for that session.

Grading Procedures

Marking procedures vary from program to program. Students should consult individual program policy statements for information.

Auditing Courses

Students may register as auditors with approval of the appropriate program director and course instructor. In addition to obtaining these signatures, students must register for zero credit in the course to be audited. The mark of R (registered) is assigned if the student's attendance and performance are satisfactory; if they are unsatisfactory, the mark of W (withdrawn) is assigned. Courses completed with a mark of R do not meet any college requirement and carry no credit toward graduation. Auditing may not be used as a second-grade-only option.

Second-Grade-Only Option

Repeating courses for the second-grade-only option is allowed in extraordinary circumstances. To repeat a course for the second-grade-only option, students must obtain the signatures of the course instructor, the program director, and the dean on a special form obtained from the program office. The properly signed form must be presented to the registrar's office before the end of the first one-fifth of the course. Both grades will remain on the permanent record, but only the second one is used to calculate grade-point average and hours earned.

Incompletes

A grade of I (incomplete) may be reported if the reasons for inability to finish the course satisfactorily are acceptable to the program director and the course instructor. There must also be evidence that the course work will be finished within a reasonable length of time, usually by the end of the next academic session. Incompletes not removed by the deadline for submission of final grades for the next session result in the assignment of a grade of F. Changing the grade when an incomplete has been converted to an F requires the signature of the dean on a change of grade form.

Credit by Examination

The procedure for the acceptance of and the granting of credit by examination varies from program to program. The program director should be consulted for further information.

Reports to Students

Instructors contact any student whose work falls below the minimum acceptable level when the problem is recognized. Grades are reported on the student's transcript, following University protocol. No formal midterm reports are given.

Academic Progress, Program Probation, and Dismissal

Students are expected to maintain satisfactory academic and professional standards and to demonstrate reasonable progress toward the degree and certificate. Students who fail to maintain satisfactory academic progress or professional standards of behavior as determined by the program are placed on probation. Probation serves as a warning that students will not graduate unless their academic performance and/or professional behavior improves.

Students on probation are restored to good standing by the program director upon evidence that the problem has been corrected. Such action is usually taken at the end of a semester or session. Entering students may be admitted on probation if they fail to meet the minimum stated standards for admission.

Continued unsatisfactory scholarship or unprofessional behavior may result in dismissal from a program. Students dismissed from a program must reapply for admission through the regular, established program admissions process, following review by the executive committee of the division, at least four months prior to the requested date of readmission.

Students placed on probation or dismissed from a program are notified in writing of

these actions by the program director; a copy is placed in their file.

Students are expected to attend classes regularly. Students who miss classes or examinations because of illness are expected to present evidence that they have been ill. Any other absences must be approved in advance by the course instructor and program director.

Any offense against good order committed by a student in a classroom, clinical setting, or laboratory may be summarily dealt with by the instructor or referred to the program director. The instructor reports in writing any disciplinary action taken against a student to the program director. Repeated or exceptional instances are reported to the dean.

Academic Misconduct

Plagiarism and Cheating

All cases of plagiarism and cheating in the College of Medicine are reported to the dean with a statement of relevant facts. The program director and the instructor concerned may submit recommendations for appropriate disciplinary action.

The individual instructor may reduce the student's grade, including assignment of the grade of F in the course. A report of this action is sent to the student, the program director, and the dean.

The dean, or a faculty committee appointed by the dean, may impose the following or other penalties as the offense may warrant: disciplinary probation, assessment of additional hours for the degree, suspension from the program for a period of time, or recommendation of expulsion from the program.

Appeals Procedure

Students who want to appeal a decision should submit an appeal in writing to the dean within two weeks after the date of receipt of the decision in writing.

Unclassified Students

Persons who do not wish to be admitted to the College of Medicine but want to register for certain courses will be admitted only if the course is an essential component of a program of studies and upon the student's compliance with all the regular requirements for admission to such a course, or by action of the faculty upon recommendation of the professor in charge of the course.

Nondepartmental Courses

50:1 Medicine Elective Fourth Year arr.

50:2 Medicine Clinical Third Year arr.

50:3 Nutrition 2 s.h.

50:4 Medicine in the Humanities 2 s.h.

50:6 Interpersonal Skills for the Medical Professional 2 s.h.
Introduction to a model of helping others through verbal communication; indicates both the stages through which this helping process generally moves and the skills the helper should exercise at each stage.

50:20 Introduction to Selected Health Professions 2 s.h.
Introduction to the history, organization, education, and role of health providers in medical technology, nuclear medicine technology, physical therapy, and physician assistant professions; current health care issues affecting these professions.

50:105 Law and Medicine for Physician Assistant Students 1 s.h.
Fundamental principles of law bearing on professional activities; basic vocabulary necessary to understand legal concepts.

50:106 Introduction to Behavioral Medicine 2 s.h.
Ways in which behavioral and biomedical sciences can be integrated to produce knowledge and techniques relevant to health and illness.

50:111 Introduction to Clinical Medicine arr.
Provides the bridge between basic sciences and required clinical clerkships; basic skills of interviewing, history taking, and performing physical exams; lectures cover all clinical medical specialties; preceptorship includes specialized faculty teaching sessions and teaching associated simulated patients.

50:112 Interdisciplinary Elective in Oncology arr.

50:121 Introduction to Clinical Medicine for Physician Assistant Students arr.

50:150 Molecular Modeling Techniques 0-2 s.h.
Theoretical and practical aspects of computer-assisted molecular modeling utilizing super-computing graphics work stations; building computer graphics models of molecules and performing molecular mechanics calculations with computers. Consent of instructor required.

50:161 Designing and Developing Instructional Materials 3 s.h.
Design, development, and use of self-paced materials. Same as 7W:121.

50:165 Biomedical Ethics 2 s.h.
Ethics vocabulary, processes of moral reasoning, and illustrative problems increasingly prevalent in modern medical work; intended for sophomore medical students.

50:166 History of Medicine in Western Society 2 s.h.

50:167 Readings in Biomedical Ethics arr.
Intended for medical, nursing, law, and graduate students. Consent of instructor required.

50:198 Advanced Biomedical Studies 2 s.h.

50:199 Advanced Biomedical Studies 2 s.h.

50:201 Dietetics Seminar 1 s.h.
Current research findings in nutrition, clinical, and administrative dietetics.

50:202 Dietetic Seminar 1 s.h.

50:203 Clinical Dietetics 1-4 s.h.
Nutritional aspects of disease and illness, with emphasis on therapeutic use of food; presented by medical and allied staff in lectures, demonstrations, discussions, and student participation.

50:204 Clinical Dietetics 1-4 s.h.
Continuation of 50:203, but may be taken as an independent unit.

50:205 Projects in Dietetics arr.
Administrative, therapeutic, epidemiologic, food science, and metabolic studies; introduction to research.

50:206 Projects in Dietetics arr.

50:207 Dietetic Research arr.
Research projects in administration, nutrition therapy, epidemiology, food science, metabolism.

50:208 Dietetic Research arr.

50:209 Hospital Dietary Administration 1-4 s.h.
Lectures and discussion of administrative techniques and methods for management, menu planning, purchasing, cost control, data processing, and food systems.

50:210 Hospital Dietary Administration 1-4 s.h.
Continuation of 50:209, but may be taken as an independent unit.

50:211 MSTP Summer Research arr.
Summer research experience for students in the Medical Scientist Training Program.

50:212 MSTP Clinical Conference 1 s.h.
Introduction to clinical research, with patient presentations and discussion of clinically oriented research topics; for students in the graduate studies component of the Medical Scientist Training Program.

50:216 Analysis of Food Service Systems 2 s.h.
Review and evaluation of methods and equipment of various food service operations.

50:234 Medical Neuroscience 4 s.h.
Same as 60:234, 72:234, 132:234.

50:262 Facilitating Learning in Health Science Education 3 s.h.
Examination of clinical teaching models; factors involved in developing a comprehensive clinic evaluation system. Same as 7W:262.

50:996 Projects in Medical Humanities arr.
Independent study within the medical humanities; objectives, methods, evaluation, and credit negotiated individually. Senior medical students should enroll in either 50:997 (on-campus) or 50:999 (off-campus).

50:997 Individual Projects: Medical Humanities arr.

50:999 Individual Projects: Medical Humanities arr.

ANATOMY

Head: Joe D. Coulter
Professors: Adel K. Afifi, Ronald A. Bergman, Ramesh C. Bhalla, Joe D. Coulter, Paul M. Heidger, Jr., William W. Kaelber, Kristy Kultas-Ilinsky, Frank J. Longo, Alexander Sandra, Robert J. Tomanek, Gary W. Van Hoesen, James R. West, Terence H. Williams
Associate professors: Martin D. Cassell, Jean Y. Jew, Masataka Kawai, Nicholas J. Pantazis, Jeanne M. Snyder
Assistant professor: Raymond Runyan
Associate: Gail Greenwald
Graduate degrees offered: M.S., Ph.D. in Anatomy

The department performs three major functions: teaching anatomy of the human body to students preparing for careers in the health care professions; providing advanced courses, teaching experience, and research training to graduate students preparing for careers in academic research and related scientific fields; and conducting original research into biological structure and structure-function relationships.

Preclinical Study for the Health Care Professions

The department contributes to the preclinical education of health care professionals by providing major courses in gross anatomy, histology, and neuroscience. The department participates in the Medical Scientist Training Program, the Cellular and Molecular Biology Training Program, and the newly established Neuroscience Program.

Graduate Programs

Master of Science

Admission to the M.S. program is limited to individuals who hold or are currently registered for a health professional degree, and to individuals who are established in a career and who seek a master's degree for reasons of professional improvement.

Doctor of Philosophy

Students in the Ph.D. program work directly for the doctorate without an intermediate master's program. They acquire in-depth knowledge of gross anatomy, histology, cell biology, embryology, and neuroscience by taking these and other courses and teaching in lecture and laboratory sections under faculty supervision. Students ordinarily require four to five years of full-time study to complete the doctorate in anatomy.

During the first year, students rotate through two or more faculty research laboratories. By the end of the first year, they choose a research area and become affiliated with a faculty member who acts as their major adviser. By the end of the second year, students undertake the comprehensive examination, define a research problem with their major adviser, and formulate a research prospectus. The comprehensive examination assesses students' ability to analyze, organize, and apply the information, concepts, and skills acquired in the first two years of the program. Subsequent years are devoted primarily to research.

The final examination for the Ph.D. consists of a public oral defense of the dissertation. The dissertation is based on original research conducted with the guidance of the major adviser and at least four other faculty members.

Financial Aid

Financial aid is awarded on a competitive basis to students admitted to the Ph.D. program. Applications for aid should be completed concurrently with the admissions application.

Admission

Applicants for admission to the Ph.D. program in anatomy should have undergraduate preparation including college mathematics, one year of organic chemistry, one year of general physics, and upper-level courses in biology. For admission requirements, see the "Graduate College" section of the *Catalog*. In addition to taking the Graduate Record Examination (GRE) General Test, applicants to the Ph.D. program in anatomy are strongly encouraged to take the Graduate Record Examination Subject Test in Biology or their major undergraduate area.

Facilities

The department occupies over 35,000 square feet in the Bowen Science Building on the health sciences campus. These quarters house modern teaching facilities and well-equipped research laboratories. The most modern instrumentation is available, including facilities and equipment for electron microscopy, microscopic digital imaging, autoradiographic studies, polymerase chain reaction, and other molecular biological techniques; spectrophotometers, cryostats, tissue culture and protein chemistry, and automated gamma/beta counting systems. Through collaborative programs with the Cancer Center, Cardiovascular Research Center, Diabetes and Endocrinology Research Center, and the Alzheimer's Disease Research Center, faculty and students also have access to outstanding research facilities throughout The University of Iowa Medical Center.

Courses

60:1 Principles of Human Anatomy 3 s.h.
Gross and microscopic human anatomy; systemic approach to all areas of the body, with emphasis on clinical relevance. Open only to pharmacy, pre-nursing, dental hygiene, and associate medical sciences majors. Prerequisite: 37:3 or equivalent.

60:2 Human Histology 4 s.h.
Microscopic study of cells, primary tissues, and organs; emphasis on tooth and related structure, including embryology. Open only to dental hygiene students. Offered fall semesters.

60:10 Demonstration Laboratory in Human Anatomy 1 s.h.
Gross and microscopic human anatomy. Open only to pre-nursing, dental hygiene and associated medical sciences majors. Corequisite: 60:1.

60:101 Human Gross Anatomy for Dental Students 6 s.h.
Regional dissection, lectures, and demonstrations, with emphasis on head and neck; includes neuroanatomy. Offered spring semesters. Graduate standing and consent of instructor required.

60:103 Gross Human Anatomy for Medical Students 7 s.h.
Regional dissection, lectures, demonstrations, tutorials, and discussions; includes clinically relevant areas of anatomical radiology and surface anatomy with clinical correlations. Open only to medical students; graduate students should register for 60:203. Offered fall semesters.

60:104 Medical Embryology 1 s.h.
Lectures on human embryology, with emphasis on the clinical aspect of development. Open only to medical students; graduate students should register for 60:217. Offered fall semesters.

60:105 General Histology for Medical Students 4 s.h.
Microscopic study of cells, fundamental tissues, and organ systems. Open only to medical students; graduate students should register for 60:205. Offered fall semesters.

60:108 Human Anatomy 4 s.h.
Regional dissection, lectures, and demonstrations, with emphasis on areas important to physical therapists. Open only to physical therapy students or to others with consent of instructor. Offered fall semesters.

60:111 Gross Human Anatomy for Physician Assistant Students 6 s.h.
Regional dissection, lectures, demonstrations, and tutorials; includes neuroanatomy and radiology. Offered summer sessions. Enrollment in Physician Assistant Program or Graduate College or consent of instructor required.

60:112 General Histology for Dental Students 4 s.h.
Microscopic study of cells, fundamental tissues, and organ systems. Open only to dental students; graduate students should register for 60:205. Offered fall semesters.

60:114 Oral Histology and Embryology 1 s.h.
Emphasis on tooth and related structures. Open only to dental students and anatomy graduate students. Offered fall semesters.

60:122 Independent Study in Anatomy arr.
Projects related to anatomy, arranged with faculty members in the department; primarily for undergraduate students. Consent of instructor required.

60:202 Anatomy Research arr.
Graduate students in anatomy arrange a program with a member of the faculty who is actively engaged in research.

60:203 Gross Human Anatomy for Graduate Students 7 s.h.
Regional dissection, lectures, demonstrations, tutorials, discussions, seminars; includes clinically relevant areas of anatomical radiology, and surface anatomy with clinical correlations. Open only to graduate students in anatomy or to others with consent of instructor. Offered fall semesters.

60:205 General Histology for Graduate Students 4 s.h.
Comprehensive study of cells, tissues, and organs at the light and electron microscopic levels. Open only to graduate students in anatomy or to others with consent of instructor. Offered fall semesters.

60:206 Problems arr.
Individual laboratory research training in a topic of the anatomical sciences; individually designed by the anatomy faculty member who consents to direct the student's independent study. Open to graduate students in anatomy who have not yet selected a dissertation research project, graduate students in other departments, and professional students, who may enroll in this course in their elective periods.

60:214 Seminar in Muscle Biology 1 s.h.
Presentations by faculty and students; topics include structure/function relationships in smooth, skeletal, and cardiac muscle. Offered spring semesters of even years. Consent of instructor required.

60:216 Cell Structure and Function 3 s.h.
Correlation of cellular ultrastructure and function. Offered fall semesters. Consent of instructor required.

60:217 Developmental Anatomy 2 s.h.
Events of normal morphogenesis and the mechanisms and patterns of abnormal development. Offered fall semesters. Consent of instructor required.

60:224 Graduate Student Seminar 0-1 s.h.
Open only to anatomy graduate students who present seminars on current research or literature topics.

60:232 Advanced Human Anatomy arr.
Advanced study of regions and systems relevant to specialty interests of the student. Open to senior medical students and graduate students; senior medical students must have consent of course director for 60:103; graduate students must arrange with the anatomy faculty member who consents to direct their work.

60:233 Advanced Histology 2 s.h.
Advanced study of cells, tissues, and organs, with emphasis on clinical relevance. Open only to sophomore, junior, and senior medical or dental students. Consent of instructor required. Prerequisite: 60:105 or 60:112.

60:234 Medical Neuroscience 4 s.h.
Lecture and laboratory; an integrated course dealing with basic principles of neurophysiology and neuroanatomy, with emphasis on the human central nervous system; the laboratory primarily involves the anatomical study of the spinal cord and brain. Offered spring semesters. Consent of course director required. Same as 50:234, 72:234, 132:234.

60:235 Advanced Neuroanatomy arr.
Advanced study of structure and function of the human nervous system. Consent of instructor required. Prerequisite: 50:234 or 60:234.

60:236 Sectional Human Anatomy 4 s.h.
Sectional human gross anatomy; three-dimensional reconstructions (anatomical and MRI images), selected anatomical dissections, and section analysis. Open only to fourth-year medical students and graduate students in anatomy. Consent of instructor required.

60:245 Developmental Neuroscience 2 s.h.
Same as 37:245, 132:245.

60:250 Topics in Neuroscience 1 s.h.
Weekly research presentations by neuroscience program faculty; introduction to the research interests of faculty and opportunities for research training in the neurosciences. Offered fall semesters. Consent of instructor required. Same as 132:250.

60:265 Neuroscience Seminar 0-1 s.h.
Student-faculty discussion of current literature in research areas bearing on neurosciences and behavior. Consent of instructor required. Same as 31:265, 37:265, 72:265, 132:265.

60:272 Seminar in Cellular and Molecular Biology 1 s.h.
Presentations by resident and visiting scientists; student presentations; discussions of current literature in cell biology. May be repeated. Consent of instructor required. Same as 37:272, 61:272, 71:272, 72:272, 99:272.

60:998 Special Study on Campus arr.
Interdisciplinary course of special study in anatomy directed by a faculty member in the department. Open only to fourth-year medical students.

ANESTHESIA

Head: John H. Tinker
Professors: Samir Gergis, Mohamed Ghoneim, Peter Jebson, Jack Moyers, John R. Moyers, Shiro Shimosato, Martin Sokoll, Michael M. Todd
Associate professors: James N. Bates, David Chestnut, Won W. Choi, Robert Forbes, Robert From, Mahesh Mehta, David Murray, Franklin L. Scamman, Tommy Symreng, David Warner
Associate professor emeritus: James G. Carter
Assistant professors: Erling Anderson, Max Baker, Robert Block, Bruce Bollen, David L. Dull, Mark Gomez, Bradley Hindman, Viney Kumar, Pontus Ostman, Kent Pearson, Alan Ross, Ruth Wachtel, Edward Wegrzynowicz
Visiting assistant professors: Winston Barcellos, Sigurdur Sigurdsson
Associates: Javier H. Campos, Niels F. Jensen, Roger D. Kinkor, Jerry Kirk, Grant D. Kruse, Linda Laszewski, Steven Lillehaug, Mazen A. Maktabi, Tanya Oyos, Stephen Stefani, SamThio SumPing, Robert Vincent
Fellow-associates: Jeanette Harrington, Mary Kemen

The department introduces the second-year medical student to anesthesia as a specialty; helps to develop in the third-year student some concepts and technical skills related to resuscitation, airway management, and the care of the comatose patient; and offers the fourth-year student intensive study in any and all phases of the department. Diverse clinical experiences, seminars and teaching conferences, and ongoing research activities help the postgraduate student or resident develop the knowledge and skills required of a specialist in anesthesia.

Courses

116:6 Clinical Anesthesia 2 s.h.
Clinical patient care in the operating room and recovery rooms; includes seminars, clinical case conferences, small-group discussion sessions.

116:10 Clinical Anesthesia Senior arr.
Instruction and practical experience in various forms of anesthesia for surgical procedures; basic techniques of general, spinal, epidural, and peripheral nerve-block anesthesia; instruction in endotracheal intubation and other airway maintenance skills; management of comatose patient and cardiopulmonary resuscitation; pharmacology of general and regional anesthetics, their impact on respiratory and cardiovascular function, and various methods of treatment; clinical anesthesia seminars, and morbidity and mortality conference.

116:11 Intensive Care arr.
Evaluation and treatment of seriously ill patients in intensive care; artificial ventilation, evaluation of pulmonary function, monitoring of cardiovascular status, fluid balance and acid-base problems, advance monitoring techniques; emphasis on postcardiac surgery patients and those needing prolonged ventilatory assistance.
Prerequisite: 4 semester hours of 116:10.

116:100 Scientific Foundations and Frontiers in Anesthesiology 1 s.h.
Basic scientific principles in clinical anesthesia; current discoveries related to anesthesiology; critique of literature.

116:998 Special Studies on Campus arr.
Research in a well-defined project relating to anesthesia; individually arranged by student with approval of department head.

116:999 Special Study off Campus arr.

DIVISION OF ASSOCIATED MEDICAL SCIENCES

Head: Rex Montgomery

The Division of Associated Medical Sciences provides coordination of professional programs for training medical technologists (with tracks in cytogenetics, perfusion, and biotechnology), nuclear medicine technologists, physical therapists, and physician assistants. Flexible undergraduate programs prepare students for entry into these professional areas. Students usually enroll initially in the College of Liberal Arts and are assigned a faculty adviser from the division.

Although each program in the division has its own admission requirements, the first two years of undergraduate study are similar. Each program requires a foundation in biology, chemistry, and mathematics; physics, computer science, and psychology are required by some programs and are highly recommended for others. Students should plan their study programs carefully so that conflicts in specifically required courses do not occur. It is imperative that students consult with the appropriate program adviser to assure the proper sequencing of courses.

The following is a typical curriculum for undergraduate students, with options being exercised after consultation with program advisers. Programs are abbreviated as follows: MT—Medical Technology (MT-CG—cytogenetics track, MT-P—perfusion track, MT-BT—biotechnology track); NMT—Nuclear Medicine Technology; PA—Physician Assistant; PT—Physical Therapy.

Freshman Year

First Semester

10:1 Rhetoric	4 s.h.
Foreign civilization and culture	3 s.h.
Physical education skills	2 s.h.
4:13 Principles of Chemistry I	3 s.h.
22M:15 Mathematics for the Biological Sciences	4 s.h.
Total	16 s.h.

Second Semester

10:2 Rhetoric	4 s.h.
Historical Perspectives	3-6 s.h.
Physical education skills	1 s.h.
4:14 Principles of Chemistry II	3 s.h.
37:3 Principles of Animal Biology (MT, all tracks)	5 s.h.
4:16 Principles of Chemistry Lab I	2 s.h.
Total	16-18 s.h.

Sophomore Year

First Semester

Humanities	3 s.h.
Social sciences	3 s.h.
4:121 Organic Chemistry I (MT, all tracks; PA)	3 s.h.
29:11 College Physics (NMT)	4 s.h.
37:3 Principles of Animal Biology (NMT, PA, PT)	5 s.h.
61:157 General Microbiology (MT, all tracks)	5 s.h.
Physical education skills	1 s.h.
Total	15-16 s.h.

Second Semester

Historical perspectives (MT)	3 s.h.
Humanities	6 s.h.
8W:112 Writing for the Sciences (MT-BT)	3 s.h.
Social sciences	3 s.h.
29:12 College Physics (NMT)	4 s.h.
100-level zoology course (PA)	3 s.h.
4:122 Organic Chemistry II (PA)	3 s.h.
31:3 General Psychology (MT-P, PT)	4 s.h.
99:110 Biochemistry (MT, all tracks)	3 s.h.
63:161 Introduction to Biostatistics (MT-CG)	3 s.h.
Total	14-18 s.h.

Students who have satisfactorily completed the above prerequisites have satisfied the minimum academic requirements for early admission to the Medical Technology (all tracks), Nuclear Medicine Technology, and Physician Assistant programs. Others complete the additional requirements below.

Junior Year

First Semester

Foreign language	4 s.h.
29:11 College Physics (PT)	4 s.h.
37:81 Human Genetics	3 s.h.
or	
37:103 Comparative Vertebrate Anatomy	4 s.h.
or	
37:112 Cell, Tissue, and Organ Biology	5 s.h.
Computer science (MT, all tracks)	
60:1 Principles of Human Anatomy (MT-P)	3 s.h.
31:13 Introduction to Clinical Psychology (PT, MT-P)	3 s.h.
72:130 Human Physiology (NMT, PT)	4 s.h.
Total	15-16 s.h.

Second Semester

Foreign language	4 s.h.
29:12 College Physics (PT)	4 s.h.

37:105 Cell Physiology	4 s.h.
60:1 Principles of Human Anatomy (NMT)	3 s.h.
72:150 Intermediate Physiology (MT, all tracks)	4 s.h.
37:128 Fundamental Genetics (PT, MT-CG)	3 s.h.
22S:101 Biostatistics (NMT, PT)	3 s.h.
or	
22S:102 Introduction to Statistical Methods (NMT, PT)	3 s.h.
Total	14-15 s.h.

Senior Year

General education, elective, or advanced courses in the departments of Biochemistry, Microbiology, Chemistry, Biology, or others specified for specific degree requirements.

MEDICAL TECHNOLOGY

Director: Marian Schwabbauer
Assistant director: Ruthanne Hyduke
Medical director: James A. Goeken
Associate professor: James A. Goeken
Lecturers: Ruthanne Hyduke, Marian Schwabbauer
Associates: Larry Birnbaum, James O'Connor
Assistants in teaching: Kathleen Kelly, Lucy Wall
Adjunct lecturers: John Abadi, Jean Lassila, Jay Moore
Adjunct associate: Thomas Persoon
Adjunct assistants in teaching: Ray Bolles, Mike Brezina, Delores Cordle, Jerry Hudson, Patricia Huff, Patricia Knebel, Marlene Loonan, Rose Meyer, Beverly Pennell, Darren Peterson, Lisa Putnam, Kathy Ryerson, Gloria Scharnweber, Glenda Skallerud, Barbara Stewart, Jan Vaught
Degree offered: B.S. in Medical Technology

Medical technologists/clinical laboratory scientists perform the laboratory tests on which physicians rely for accurate diagnosis and proper treatment of disease. They are in demand in hospital, private, and government laboratories; clinics; physicians' offices; and industrial, pharmaceutical, biological, and medical research laboratories. Medical technologists/clinical laboratory scientists are highly skilled health team members who use a battery of sophisticated procedures and instruments in their work and who possess specialized knowledge and skills acquired through completion of a formal program of academic and clinical study.

The Medical Technology Program is sponsored cooperatively by the College of Medicine, the College of Liberal Arts, The University of Iowa Hospitals and Clinics, and the Iowa City Veterans Affairs Medical Center. Satisfactory completion of the program qualifies students to take all medical technologist/clinical laboratory scientist certification examinations. The program is approved by the Council on Medical Education of the American Medical Association and by the National Accrediting Agency for Clinical Laboratory Sciences. Assuming that students have completed the required courses indicated above in the freshman and sophomore years, the remaining curriculum may be as follows.

Junior Year

First Semester

Foreign language	4 s.h.
37:128 Fundamental Genetics (MT-CG)	3 s.h.
Electives	8 s.h.
Total	15 s.h.

Second Semester

63:162 Design and Analysis of Experiments in the Biomedical Sciences (MT-BT)	3 s.h.
Foreign language	4 s.h.
72:150 Intermediate Physiology (all tracks)	4 s.h.
69:119 Instrumentation in Clinical Laboratory Science (all tracks)	3 s.h.
69:136 Independent Study in Immunology	1 s.h.
Electives	6 s.h.
Total	17 s.h.

Highly recommended elective courses include parasitology, quantitative analysis, and statistics.

Senior Year

The clinical program consists of a minimum of 12 months of didactic and practical instruction. The first summer session and semester of all tracks are devoted to lectures, laboratory experience, demonstrations, and seminars covering theory and technique in clinical laboratory science. During the last semester, students rotate through the clinical laboratory facilities of The University of Iowa Hospitals and Clinics, the Iowa City Veterans Affairs Medical Center, and other hospitals. They attend additional lectures and may begin a specialized track, if they wish.

The program is made up of the following courses:

69:119 Instrumentation in Clinical Laboratory Science	3 s.h.
69:120 Clinical Microscopy for Medical Technologists	1 s.h.
69:121 Immunology for Medical Technologists	1 s.h.
69:122 Clinical Chemistry for Medical Technologists	5 s.h.
69:123 Immunohematology for Medical Technologists	3 s.h.
69:124 Clinical Hematology for Medical Technologists	5 s.h.
69:125 Microbiology for Medical Technologists	6 s.h.
69:126 Clinical Chemistry for Medical Technologists	5 s.h.
69:127 Clinical Immunohematology for Medical Technologists	2 s.h.
69:128 Clinical Microbiology for Medical Technologists	5 s.h.
69:129 Clinical Hematology for Medical Technologists	3 s.h.
69:131 Clinical Laboratory Science Seminar	2 s.h.
69:132 Parasitology for Medical Technologists	1 s.h.

Alternate tracks include the following courses.

Biotechnology

69:135 Independent Study in Clinical Laboratory Science	arr.
69:175 Selected Biomedical Research Techniques	arr.

Cytogenetics

69:150 Medical Cytogenetics	3 s.h.
69:151 Medical Cytogenetics Laboratory	2 s.h.
69:152 Medical Cytogenetics Seminar	1 s.h.
69:155 Clinical Medical Cytogenetics	arr.

Highly recommended pre-entry courses include 37:112 and 37:118.

Perfusion

69:160 Respiratory and Renal Physiology	3 s.h.
69:161 Introduction to Medical Electronics and Biophysical Monitoring	3 s.h.
69:162 Cardiovascular Anatomy, Physiology, and Pathology	5 s.h.
69:163 Perfusion Technology I	8 s.h.
69:164 Perfusion Technology II	5 s.h.
69:165 Clinical Perfusion Techniques and Methods	arr.
69:166 Pharmacology for Perfusionists	2 s.h.
69:167 Perfusion Seminar	2 s.h.
69:168 Perfusion Research	4 s.h.

Highly recommended pre-entry courses include anatomy, statistics, and physics.

Cytotechnology and Histology

Additional tracks in cytotechnology and histology are being considered; for current status or information, consult the director of the Medical Technology Program.

For course descriptions, see "Pathology" in this section of the *Catalog*.

Admisson

The medical technology/clinical laboratory science professional program is limited to 30 students, who begin the program in late May. Applications close October 31. Fifteen students continue during the fall and spring semesters and complete the program in May. The other fifteen have the opportunity to complete unfinished prerequisite course work during the fall semester and then return to the program for the spring and fall semesters of the following year, graduating in December. Additional students who wish to complete alternate tracks (cytogenetics, perfusion, or biotechnology) must observe the same admissions process and complete the first two sessions of the program year. The amount of additional time required varies from track to track.

To apply for admission to the professional program, students must be able to complete all of the following prerequisites and University graduation requirements by the end of the professional (clinical) year:

Fourteen semester hours of chemistry, including qualitative analysis, organic chemistry, and biochemistry;

Three semester hours of mathematics; and

Fourteen semester hours of biology, including general zoology, microbiology, and physiology.

Admission is on a competitive basis. Minimum cumulative grade-point averages of 2.60 overall and 2.60 in science generally are required. Applicants who enter the program as undergraduate students must meet the general admission requirements of the University's College of Liberal Arts and should consult with the director of the Medical Technology Program as early as possible to plan preclinical studies to meet all requirements.

Expenses

Medical technology students in the professional-year curriculum are responsible for their textbooks, University tuition, and student fees. Laboratory coats and equipment such as microscopes are provided by the program.

NUCLEAR MEDICINE TECHNOLOGY

Director: Kenneth B. Holmes
Medical director: Peter T. Kirchner
Technical director: John A. Bricker
Professors: Frank H. Cheng, Steve M. Collins, Peter T. Kirchner, Richard E. Peterson
Associate professors: Richard Hichwa, Karim Rezai, James E. Seabold
Assistant professor: Mark T. Madsen
Associates: Daniel Kahn, G. Leonard Watkins
Clinical associate professor: James A. Ponto (College of Pharmacy)
Visiting associate: Karen Beetham
Adjunct lecturer: Kenneth B. Holmes
Degree offered: B.S. in Nuclear Medicine Technology

Nuclear medicine technology is a medical specialty that uses the past two decades and is still expanding and growing in complexity. This continued expansion of the specialty has fostered an increasing demand for highly skilled and motivated nuclear medicine technologists.

Nuclear medicine technologists generally work in hospitals and clinics. At the heart of nuclear medicine technology is the use of sophisticated detectors and computers to trace the movement and localization of radioactive tracers in the human body.

Other basic job responsibilities may include radiation safety; quality control; radiopharmaceutical preparation and administration; and collection and preparation of biological specimens to measure levels of hormones, drugs, or other body components. In all these functions, the nuclear medicine technologist works hand-in-hand with nuclear medicine physicians, health physicists, radiopharmacists, and radiochemists as an integral part of a highly trained specialty team.

The Nuclear Medicine Technology Program at The University of Iowa is fully accredited by the Committee on Allied Health Education and Accreditation and the Council on Medical Education of the American Medical Association. Fulfillment of the requirements established by the AMA Accreditation Board involves three years of preclinical work in the College of Liberal Arts and the College of Medicine, and a minimum of 12 months of professional clinical experience, available at The University of Iowa Hospitals and Clinics and the Veterans Affairs Medical Center.

Upon satisfactory completion of the four-year program, students receive the Bachelor of Science degree from the College of Medicine and a certificate of training. Graduates are then eligible for national certification as nuclear medicine technologists.

The required courses in the freshman and sophomore years emphasize the physical and biological sciences, which provide a basic background for further development in the junior year.

Applicants are strongly advised to pursue a course of study that is applicable to a baccalaureate degree, most commonly in biology, chemistry, biochemistry, or microbiology. In this way, students who are not admitted to the NMT program can complete a degree in their chosen area.

Junior Year

The following are recommended courses:

60:1 Principles of Human Anatomy	3 s.h.
72:130 Human Physiology	4 s.h.
22C:7 Introduction to Computing with FORTRAN	3 s.h.
or	
22C:1 Survey of Computing	3 s.h.
22S:25 Elementary Statistics and Inference	3 s.h.
or	
22S:101 Biostatistics	3 s.h.
or	
63:161 Introduction to Biostatistics	3 s.h.
71:120 Drugs: Their Nature, Action, and Use	2 s.h.

Advanced courses in chemistry, biology, or physics based on alternative major, possible minors, interest, and career goals.

Senior Year

The curriculum of this clinical year is organized in accordance with the "Essentials of an Accredited Educational Program in Nuclear Medicine Technology." Courses are taught in the following areas: radiopharmacy, radiobiology, radioimmunology, radioimmunoassay laboratory procedures, radiation protection, patient care, medical terminology, anatomic and physiologic bases of nuclear medicine procedures, physics and instrumentation, administration and management, mathematics and statistics of nuclear medicine, and computer applications in nuclear medicine. Clinical rotations focus on nuclear imaging, clinical radiopharmacy, computer applications, and quantification of radioactivity in vivo and in vitro, including kinetic studies. Rotations also are established in radioimmunoassay, diagnostic X-ray, computed tomography, magnetic resonance imaging, echocardiography, cardiac catheterization, and ultrasound.

The clinical year consists of these courses.

74:101 Principles of Nuclear Medicine I	6 s.h.
74:102 Introductory Clinical Nuclear Medicine	6 s.h.
74:103 Principles of Nuclear Medicine II	3 s.h.
74:104 Intermediate Clinical Nuclear Medicine	9 s.h.
74:105 Advanced Clinical Nuclear Medicine	6 s.h.

For course descriptions, see "Radiology" in this section of the *Catalog*.

Admission

Prerequisites for early admission to the Nuclear Medicine Technology Program include the following:

A minimum of 60 semester hours in all course work, with a minimum cumulative grade-point average of 2.50;

Fulfillment of the College of Liberal Arts General Education Requirements in rhetoric, physical education, humanities, historical perspectives, foreign civilization and culture, and social sciences (sociology and psychology are recommended);

A minimum of 20 semester hours in three science areas, including a complete introductory course with laboratory in chemistry, physics, and zoology;

A minimum of 3 semester hours in mathematics, including at least intermediate algebra.

Fulfillment of these basic admission requirements does not ensure acceptance into the Nuclear Medicine Technology Program. Promotion from the junior year to the final clinical year is conditional upon satisfactory completion of a minimum of 94 semester hours of study in the recommended areas.

A new class begins in late August each year. Application materials must be received by March 1. Personal interviews are scheduled in April and the class is selected by May 1. At present, the class size is limited to ten students. Prospective students are encouraged to consult with the program office to plan an appropriate preprofessional program.

PHYSICAL THERAPY

Director: Gary Soderberg
Professors: Gary Smidt, Gary Soderberg
Associate professors: Carl Kukulka, David Nielsen
Assistant professor: Thomas Cook
Lecturers: John Barr, Byron Bork, Carolyn Wadsworth
Adjunct assistant professor: William Dostal
Adjunct lecturer: Donald Shurr
Adjunct associates: Rhonda Barr, Karen Drake, Keyron Laubenthal, Ken Leo, Loretta Lough, Bruce Miller, Richard Shields, John Wadsworth
Graduate degrees offered: M.P.T.; M.A. in Physical Therapy

Physical therapists participate in evaluation of the capabilities and disabilities of patients. They provide treatment to alleviate pain; prevent, correct, or minimize deformity; and improve the general health status of the individual. They administer physical therapy facilities, supervise support personnel, do clinical research and teaching, and consult with other health professionals.

A wide variety of opportunities exist for professional practice in general or specialized hospitals, in programs for disabled children, and in physical therapy clinics, extended care facilities, nursing homes, community and governmental agencies, rehabilitation centers, the armed forces, foreign service, and athletic departments. Additional career opportunities are available for teaching in educational programs of physical therapy and related professions.

Education in the program is available at three different levels: the basic professional (Master of Physical Therapy), Master of Arts, and more advanced training obtained by completing the Ph.D. in exercise science (Division of Physical Education), in physical education with special emphasis on therapeutics. There are 60 students in the basic professional program and approximately 25 full- and part-time students in advanced degree programs. The facilities are well-equipped for classroom and laboratory instruction. The Physical Therapy Program is located in the College of Medicine on the health center campus, which includes The University of Iowa Hospitals and Clinics, the nation's largest university-owned teaching hospital. This location makes several resources readily accessible to the Physical Therapy Program: basic science and medical faculty, basic science courses, and intangible benefits associated with a college of medicine environment.

Professional Program

Master of Physical Therapy

The professional program is fully accredited by the American Physical Therapy Association. Satisfactory completion of the professional program qualifies candidates for the Assessment Systems Inc. (A.S.I.) exam for licensure in Iowa and other states.

The two-year Master of Physical Therapy Program consists of the following courses.

First Semester

60:108 Human Anatomy	4 s.h.
69:203 Introduction to Human Pathology	3 s.h.
101:141 Principles of Physical Therapy	4 s.h.
101:210 Kinesiology and Pathomechanics	4 s.h.

Second Semester

60:234 Medical Neuroscience	4 s.h.
101:131 Therapeutic Physical Agents I	4 s.h.
101:185 Musculoskeletal Therapeutics	2 s.h.
101:191 Clinical Education I	1 s.h.
101:202 Orthopedics and Manual Physical Therapy	4 s.h.

Third Semester

101:122 Psychosocial Aspects of Patient Care	1 s.h.
101:176 Principles of Neurology	1 s.h.
101:192 Clinical Education II	1 s.h.
101:201 Applied Clinical Medicine	2 s.h.
101:206 Cardiopulmonary Therapeutics	4 s.h.
101:249 Research Practicum I	1 s.h.
Elective	3 s.h.

Fourth Semester

101:121 Physical Therapy Management and Administration	2 s.h.
101:170 Prosthetics and Orthotics	2 s.h.
101:193 Clinical Education III	1 s.h.
101:225 Neuromuscular Therapeutics	4 s.h.
101:250 Research Practicum II	3 s.h.
Elective	3 s.h.

Summer Session

101:194 Clinical Internship (May-August)	6 s.h.

Fifth Semester

101:194 Clinical Internship (August-October)	3 s.h.

Admission

A new class is admitted to the Master of Physical Therapy Program each fall. To qualify for admission to the MPT program, applicants must have completed or planned to complete before enrollment a baccalaureate degree from a regionally accredited institution in the United States. The following course prerequisites must be included in the baccalaureate degree program:

Biological sciences—a complete introductory course in principles of general biology or zoology and advanced course work in biology or zoology equivalent to 12 semester hours;

Physics—a complete introductory course equivalent to 8 semester hours;

Chemistry—a complete introductory course equivalent to 8 semester hours;

Physiology—a systemic human physiology course equivalent to 3 semester hours;

Psychology—courses equivalent to 6 semester hours;

Mathematics—a college-level mathematics course equivalent to 3 semester hours; and

Statistics—a college-level statistics course equivalent to 3 semester hours.

All science courses must include the appropriate laboratory instruction.

An overall grade-point average of 2.70 or above (on a 4.00 scale) is the minimum for consideration for admission. In addition, a grade-point average of 3.00 or above in all prerequisite course work, including elective basic science courses, is recommended.

Three letters of recommendation are required and should be sent directly to the Physical Therapy Program office.

Applicants must take the Graduate Record Examination (GRE) General Test. Students should arrange to take the test early in order to ensure receipt of the results of the examination by the application deadline (February 1).

Personal interviews are required of candidates selected for consideration by the admissions committee. Because the number of students admitted to each class is limited, not all applicants will be invited for an interview. Selections for each class are made from the applicants interviewed. All interviews are conducted at The University of Iowa. The physical therapy admissions committee selects applicants who appear to be best qualified for the study and practice of the profession.

Applications are accepted beginning September 1 for the following year. Prospective students are urged to apply as early as possible. The closing date is February 1.

Expenses

In addition to general University expenses, students in the Master of Physical Therapy Program are responsible for the purchase of uniforms, malpractice insurance, and course syllabi.

Graduate Programs

Master of Arts

The Master of Arts in physical therapy emphasizes research and teaching in three areas of physical therapy: cardiopulmonary, musculoskeletal, and neuromuscular. The program focuses on theoretical and clinical applications for assessment and treatment of patient disorders in the three specialty areas. Clinical practicum experiences are offered to complement these specialties. The master's degree requires a minimum of 30 semester hours of graduate course work. Completion of basic professional physical therapy education is a prerequisite. Clinical experience is recommended.

Physical therapy research laboratories are available. These laboratories are well-equipped with electromechanical systems and computers for measurement and analysis of cardiopulmonary responses (heart rate, blood pressure, energy cost, and ventilation), musculoskeletal function (muscle strength and endurance, gait, posture, and disability evaluation), and neuromuscular activity (electromyography, spinal reflexes, CNS control mechanisms). Use of extradepartmental laboratories also may be arranged.

Collaborative studies are encouraged with other departments, such as neurology, internal medicine, pediatrics, orthopaedic surgery, physiology and biophysics, anatomy, engineering, and pharmacology, and with personnel in the physical therapy clinics.

Students successfully completing the M.A. program in physical therapy will:

- Be able to engage in teaching at the undergraduate and postbaccalaureate basic professional level of physical therapy training and show promise of teaching at the advanced master's level;
- Be able to engage in original scholarship and research directed toward the discovery of new knowledge and the development of theoretical principles that will advance the understanding of physical therapy clinical practices;
- Have knowledge of the physical therapy theoretical and research literature related to a specific topic; and
- Be skilled in the application of basic concepts in the areas of cardiopulmonary, musculoskeletal, and neuromuscular physical therapy.

The following are required courses.

101:212 Biomedical Instrumentation	3 s.h.
101:301 Thesis: Physical Therapy	4 s.h.*
101:326 Analysis of Scientific Literature	2 s.h.
63:162 Design and Analysis of Experiments in the Biomedical Sciences	3 s.h.

One of the following four specialty courses:

101:213 Biomechanical Principles of Therapeutics	arr.
101:260 Health Promotion and Cardiopulmonary Therapeutics	arr.
101:270 Occupational Biomechanics	arr.
101:275 Analysis of Sensori-Motor Systems in Health and Disease	arr.

The following are recommended courses:

7W:120 Introduction to Instructional Design and Technology	3 s.h.
69:203 Introduction to Human Pathology	3 s.h.
101:325 Independent Study	arr.
101:295 Electromyography in Kinesiology and Biomechanics	3 s.h.
101:327 Research in Therapeutics	arr.
27:153 Advanced Anatomy and Kinesiology	2 s.h.
27:141 Exercise Physiology	3 s.h.
71:120 Drugs: Their Nature, Action, and Use	2 s.h.
7W:262 Facilitating Learning in Health Science Education	3 s.h.
101:280, 282, or 284 Practicum (teaching, research and/or clinical)	3 s.h.**

*Maximum of six semester hours.
**May be taken pass-fail.

Admission

To be considered for admission, applicants must be graduates of an approved professional program of physical therapy and must have earned a grade-point average of 2.75 or higher (on a 4.00 scale) on all undergraduate work. Two years of clinical experience also is highly desirable.

Admission to the master's degree program is based on the grade-point average for previous collegiate academic work; scores on the Graduate Record Examination (GRE) General Test; recommendation from three sources; and a personal interview. Applicants also must meet the requirements established by the Graduate College.

Applicants must complete the Graduate College application. The application is reviewed after applicants have been accepted by the Graduate College and all aspects of the written application for the Physical Therapy Educational Programs are submitted. Deadlines for completed written applications are October 15 (notification by December 15), March 15 (notification by May 15); and May 15 (notification by July 15).

Doctor of Philosophy in Physical Education (Therapeutics)

Doctoral training related to physical therapy is received in a program in exercise science (Division of Physical Education), with special emphasis on therapeutics. The program is described in detail under "Exercise Science and Physical Education" in the "College of Liberal Arts" section of the *Catalog*.

Students successfully completing the Ph.D. program in physical education with the specialty in therapeutics will:

- Be able to teach at the basic professional and master's degree levels of physical therapy education and show promise of teaching at the doctoral level;
- Be able to perform original scholarship and research directed toward the discovery of new knowledge and the development of theoretical principles that will advance the understanding of physical therapy clinical practices;
- Have comprehensive knowledge of theoretical and research literature in areas of specialization; and
- Be skilled in the application of basic and advanced concepts in the areas of cardiopulmonary, musculoskeletal, and neuromuscular physical therapy.

Admission

Students are admitted to the study program leading to the Ph.D. degree on the basis of their grade-point average on work completed for the master's degree and scores on the GRE General Test. To be considered for admission, students must have earned a grade-point average of 3.00 or higher on all graduate work undertaken. In addition, their GRE scores must be on file at The University of Iowa.

Applicants must complete the Graduate College application. The Office of Admissions evaluates application materials to ensure that the minimum Graduate College standards are met. The application, including test scores and copies of transcripts, is then sent to the department for review.

Deadlines for the completed written applications are October 15 (notification by December 15); March 15 (notification by May 15); and May 15 (notification by July 15).

Financial Aid

A number of teaching and research assistantships are available; part-time clinical work also may be available.

Courses

101:121 Physical Therapy Management and Administration **2 s.h.**
Lectures and discussions related to principles of management in physical therapy practice.

101:122 Psychosocial Aspects of Patient Care **1 s.h.**
Emotional reactions to disability and psychosocial aspects of disability as they relate to patient-physical therapist interaction.

101:131 Therapeutic Physical Agents I **4 s.h.**
Critical study of the physical and physiological basis, rationale, techniques, and problems associated with clinical use of therapeutic physical agents, including massage, heat, cold, hydrotherapy, ultraviolet light, electricity, and electrodiagnostic techniques.

101:141 Principles of Physical Therapy **4 s.h.**
Patient treatment and discussion of the profession (e.g., history, ethics, and professional issues); the team approach to patient care; teaching-learning theory; problem-oriented medical records; patient management skills; assessment of gait, joint motion, and strength; lectures and laboratories.

101:170 Prosthetics and Orthotics **2 s.h.**
Principles and techniques in the design and use of prosthetic and orthotic devices.

101:176 Principles of Neurology **1 s.h.**
Lectures, demonstrations, and case presentations of neurologic disorders treated by physical therapists; emphasis on understanding underlying disease processes and defining patient problems. Same as 64:112.

101:185 Musculoskeletal Therapeutics **2 s.h.**
Principles and techniques of therapeutic exercise related to prevention, correction, and alleviation of physical dysfunction; follows 101:141 with continued instruction in assessment and treatment skills needed to manage common musculoskeletal problems.

101:191 Clinical Education I **1 s.h.**
Part-time clinical experience in patient care under the supervision of the clinical education faculty in several different clinical facilities.

101:192 Clinical Education II **1 s.h.**
Continuation of 101:191; theory of physical therapy procedures correlated to practice; development of competence in basic skills.

101:193 Clinical Education III 1 s.h.
Continuation of part-time clinical education interspersed with a short-term, full-time block.

101:194 Clinical Internship arr.
Full-time clinical education divided among three settings; students develop competence in independent assessment and treatment of patients under supervision of clinical faculty; 21-week minimum.

101:201 Applied Clinical Medicine 2 s.h.
Lectures, case presentations, and discussion of medical disorders from the standpoints of etiology, clinical signs and symptoms, treatment, and prognosis; case study project.

101:202 Orthopedics and Manual Physical Therapy 4 s.h.
Lectures, demonstrations, and laboratories present the pathology, assessment, and management of orthopedic disorders.

101:206 Cardiopulmonary Therapeutics 4 s.h.
Review of cardiorespiratory anatomy and physiology; application of basic concepts and techniques in physical therapy involvement in health promotion and management of patients with acute and chronic cardiac and pulmonary disorders.

101:210 Kinesiology and Pathomechanics 4 s.h.
Selected anatomical, structural, and functional properties of human connective, muscular, and nervous tissues and skeletal structures; emphasis on mechanical, neuroregulatory, and muscular influences on normal and pathological motion.

101:212 Biomedical Instrumentation arr.
Basic principles of electronics and measurement and their application to physical therapy research and practice. Offered fall semesters.

101:213 Biomechanical Principles of Therapeutics arr.
Mechanical and physiological principles applied to the study of human movement; emphasis on exercise, posture, locomotion; laboratories. Offered fall semesters of even years.

101:214 Advanced Seminar in Physical Therapy arr.
Current status of research for biological, mechanical, and psychological components pertinent to cardiopulmonary, musculoskeletal, and neuromuscular areas of physical therapy.

101:220 Seminar: Physical Therapy arr.

101:225 Neuromuscular Therapeutics 4 s.h.
Lectures, demonstrations, and case presentation of principles and techniques of therapeutic methods relative to neuromuscular reeducation; focus on therapeutic techniques used in the treatment of neurologic disorders of adults and children.

101:249 Research Practicum I 1 s.h.
Concepts of the scientific method; students critique selected scientific articles and develop a proposal for a research project relevant to physical therapy-related problems; lectures, readings.

101:250 Research Practicum II 3 s.h.
Group research projects involving data collection, data analysis, preparation of a final written report, and oral presentation and defense; faculty/staff supervision.

101:260 Health Promotion and Cardiopulmonary Therapeutics arr.
Anatomical and physiological principles applied to the health care continuum, including wellness programs and cardiac and pulmonary rehabilitation; topics may include body composition and weight control, exercise and hypertension, diabetes and cardiopulmonary adaptations to training; laboratories. Offered spring semesters of odd years.

101:270 Occupational Biomechanics arr.
Identification, description, and discussion of biomechanical factors that affect the performance of occupational tasks; emphasis on prevention of musculoskeletal injuries; topics include anatomical and physiological limits, workplace and tool design, and traditional and newer methods of worker evaluation and workplace analysis. Offered spring semesters of odd years.

101:275 Analysis of Sensori-Motor Systems in Health and Disease arr.
Identification, description, and discussion of neurophysiological mechanisms underlying posture and movement in the normal and pathologic conditions; systems approach to nervous system control of movement—evaluation of spinal cord, brain stem, and higher center function in the control of movement. Offered fall semesters of odd years.

101:280 Teaching Practicum arr.
Individual instruction, observation, and experimentation in teaching, guidance, and analysis of evaluation processes in the Physical Therapy Program.

101:282 Clinical Educational Practicum arr.
Clinical physical therapy practice designed to provide opportunity for application of newly acquired knowledge and skill in a clinical setting; specialty oriented.

101:284 Practicum in Research arr.
Laboratory experiences connected with the investigative process; individual instruction, observation, and activities predominantly in the methodological development, data acquisition, and data analysis aspects of research.

101:295 Electromyography in Kinesiology and Biomechanics 3 s.h.
Electromyographic recording instruments and techniques commonly used in kinesiologic and biomechanical studies; intramuscular and surface electrode techniques are performed in the laboratory and variables such as muscle length, tension, and type of contraction are evaluated; use of electromyography in motor unit training and biofeedback. Offered spring semesters of even years. Same as 27:295.

101:301 Thesis: Physical Therapy arr.
Investigative process: formulation of problem, literature search and analysis, procedure for collecting data, data analysis, and organization and writing of thesis proposal and thesis.

101:325 Independent Study arr.
Problem-solving experience related to physical therapy; commensurate with student's interest and ability.

101:326 Analysis of Scientific Literature arr.
Seminar designed to develop students' ability to evaluate experimental research and write a proposal; recommended for first-year graduate students. Offered spring semesters.

101:327 Research in Therapeutics arr.
Individual student effort to place some phase of physical therapy on a sound scientific base of physical therapy, and to initiate, refine, and/or establish methods included in physical therapy evaluation and treatment; may be accomplished by direct clinical and laboratory means, a philosophical treatise, or research proposal.

PHYSICIAN ASSISTANT PROGRAM

Director: Denis Oliver
Medical director: Douglas W. Laube
Professors: Douglas W. Laube, Denis Oliver
Assistant director and adjunct assistant in teaching: Michael J. Huckabee
Assistant in teaching: Geoff LaGary
Degree offered: B.S. in Physician Assistant Program

The physician assistant works in one of the newest and most exciting health care professions in the country. Physician assistants are qualified by specialized academic and clinical education to perform a wide range of medical activities under the supervision of a physician. In a typical office setting, the PA frequently is the first to see the patient, take a medical history, complete a physical examination, and order appropriate laboratory and/or X-ray studies. Working with the supervising physician, the PA participates in formulating and executing a treatment plan to meet the patient's needs.

Depending on the practice setting, the PA conducts hospital rounds, house calls, and visits to the nursing home and helps the physician in the operating or emergency room.

The Physician Assistant Program at The University of Iowa is accredited by the American Medical Association's Accreditation Review Committee on Education for the Physician Assistant. The program is approved by the Iowa Board of Medical Examiners and is a member of the Association of Physician Assistant Programs. Completion of the program qualifies students for the Bachelor of Science degree and for the opportunity to take the National Certifying Examination for Primary Care Physician Assistants. Successful completion of the national certifying examination is a prerequisite for registration as a physician assistant in Iowa.

The demand for physician assistants in all types of health care settings is growing as their role expands into a variety of health care situations. The educational program at The University of Iowa emphasizes primary care medicine, and in particular, family medicine. However, with the increasing employment opportunities for physician assistants in specialty areas of medicine, the program also offers elective clinical rotations in selected subspecialties of medicine.

Courses of Study

There are two courses of study in the Physician Assistant Program: one at the baccalaureate level and the other a combined baccalaureate and master's level program.

Professional Program

The Physician Assistant Program is an integral part of the College of Medicine. The first year of the program is taken at The University of Iowa Health Center. A major portion of the second-year clinical work occurs throughout the state in medical care settings.

The two-year educational program is divided into three broad phases.

The initial didactic phase consists of seven months of course work in a number of basic science areas, including anatomy, biochemistry, clinical pathology, microbiology, pathology, pharmacology, and physiology. Whenever appropriate, related subjects are integrated to provide sequential lecture and laboratory experience. Also offered during this session is a seminar course on the history, development, and future of the physician assistant profession, as well as courses in law and medicine, preventive medicine, and an introduction to medical history and physical examination.

The second phase is 50:121 Introduction to Clinical Medicine for Physician Assistant Students. This full-semester course involves the application of basic science knowledge to the understanding of clinical-pathologic correlations of the common and/or catastrophic disorders encountered in the

major disciplines of clinical medicine. Students also are instructed in the science and art of obtaining a medical history and performing a thorough physical examination. This course is taken with sophomore medical students.

The third clinical phase consists of a 34- to 36-week core primary-care curriculum, including six weeks each of family medicine, general internal medicine, obstetrics/gynecology, pediatrics, psychiatry (four to six weeks), and surgery. Students select either a primary-care or specialty track, twelve to fourteen weeks in length. The primary-care track includes an additional six weeks of family medicine, and electives might include geriatrics, emergency medicine, cardiology, dermatology, and orthopaedics. The specialty track might include any of the electives mentioned or other rotations in more specialized areas such as transplant surgery, gastroenterology/hepatology, and pulmonary.

These clinical rotations are designed to provide students with instruction and experience in the care of patients in a manner that facilitates effective integration of the knowledge, skills, and attitudes derived from the basic science and preclinical phases of the program. Clinical training is provided by The University of Iowa Hospitals and Clinics, the Veterans Affairs Medical Centers in Des Moines and Iowa City, Broadlawns Medical Center in Des Moines, and other affiliated hospitals throughout the state. Students gain additional clinical experience through placement with selected preceptors involved in clinical work in office-based practices.

The didactic and clinical phases of the program emphasize primary health care delivery and the use of physician assistants as members of the health care team. The program is integrated with the teaching of the College of Medicine, permitting interdisciplinary activities between various medical and health care professional students.

Professional Curriculum

First Year

Phase I

71:125 Pharmacology for Health Sciences: Physician Assistant Students 6 s.h.
50:105 Law and Medicine for Physician Assistant Students 1 s.h.
60:111 Gross Human Anatomy for Physician Assistant Students 6 s.h.
61:112 Health Sciences Microbiology 4 s.h.
69:203 Introduction to Human Pathology 4 s.h.
69:130 Clinical Pathology for Physician Assistant Students 2 s.h.
72:164 Human Physiology for Physician Assistant Students 4 s.h.
99:164 Biochemistry for Physician Assistant Students 3 s.h.
117:101 Seminar for Physician Assistant Students 1 s.h.
117:102 Introduction to the Medical and Physical Examination for Physician Assistant Students 1 s.h.
117:105 Preventive Medicine for Physician Assistant Students 1 s.h.

Phase II

50:121 Introduction to Clinical Medicine for Physician Assistant Students 20 s.h.

Second Year

Phase III

The following are required clinical rotations.

70:555 Pediatrics for Physician Assistant Students 6 s.h.
75:555 General Surgery for Physician Assistant Students 6 s.h.
78:555 Internal Medicine for Physician Assistant Students 6 s.h.
115:555 Family Practice I for Physician Assistant Students 6 s.h.
66:100 Obstetrics and Gynecology for Physician Assistant Students 6 s.h.
73:100 Psychiatry for Physician Assistant Students 4-6 s.h.

Elective clinical rotations are selected from the following.

70:102 Pediatrics Elective for Physician Assistant Students arr.
75:100 Emergency Room Elective for Physician Assistant Students 4 s.h.
76:102 Orthopaedics Elective for Physician Assistant Students 2 s.h.
115:500 Family Practice Elective for Physician Assistant Students arr.
115:556 Family Practice II for Physician Assistant Students 6 s.h.
78:100 Internal Medicine Elective for Physician Assistant Students arr.
62:5 Dermatology Elective for Physician Assistant Students 2 s.h.
64:100 Neurology Elective for Physician Assistant Students 2 s.h.
67:108 Ophthalmology Elective for Physician Assistant Students arr.
74:5 Radiology Elective for Physician Assistant Students 2 s.h.
75:110 Surgery Elective for Physician Assistant Students arr.
75:111 Surgery Elective (Transplant/Organ Retrieval) for Physician Assistant Students arr.
75:112 Surgery Elective (Burn Unit) for Physician Assistant Students arr.
76:105 Rehabilitation Elective for Physician Assistant Students 2 s.h.
78:110 Internal Medicine Elective (Cardiology) for Physician Assistant Students 4 s.h.
78:130 Internal Medicine Elective (EKG) for Physician Assistant Students arr.
78:150 Internal Medicine Elective (Oncology) for Physician Assistant Students arr.
78:180 Internal Medicine Elective (Geriatrics) for Physician Assistant Students arr.
78:553 Internal Medicine Elective (Hospice) for Physician Assistant Students arr.
78:554 Internal Medicine Elective (Infectious Disease) for Physician Assistant Students arr.
78:605 Internal Medicine Elective (Pulmonary) for Physician Assistant Students arr.
79:120 Urology Elective for Physician Assistant Students 2 s.h.
66:110 Obstetrics and Gynecology Elective for Physician Assistant Students arr.
73:101 Psychiatry Elective for Physician Assistant Students arr.

Admission

To be eligible for admission to the physician assistant professional program, applicants must have completed at least 60 semester hours of college level study, including:

College of Liberal Arts General Education Requirements in rhetoric, physical education skills, historical perspectives, humanities, quantitative or formal reasoning, foreign civilization and culture, social sciences, and foreign language;

Complete introductory courses in inorganic and organic chemistry; and

A complete introductory course and at least one advanced course in zoology or animal biology.

It is also strongly recommended, although not required, that applicants' backgrounds include analytical geometry, beginning calculus, and physics.

Applicants must have achieved at least a 2.50 grade-point average on the last 60 semester hours of college course work undertaken. The admissions committee gives special attention to applicants' performance in science courses. In the past, successful applicants have had a cumulative and science grade-point average of 3.20, a total of 125 semester hours of college credit, of which 55 semester hours were in the sciences, and approximately one year of full-time or part-time health-related patient care experience.

Satisfaction of the basic admission requirements does not ensure acceptance into the Physician Assistant Program. The admissions committee selects the applicants it considers best qualified. Applicants with previous health care experience involving direct patient contact receive preferential consideration. The committee requests interviews with the most qualified applicants.

Students are advised to pursue a course of study that is applicable to a baccalaureate degree, most commonly in the areas of biology, chemistry, or biochemistry. In this way, students who are not admitted to the Physician Assistant Program can pursue the baccalaureate degree.

Each new class begins the last week in May. Applications are accepted beginning one year in advance, and close January 15. Each applicant must complete the Physician

Assistant Program application and submit at least three letters of recommendation.

Expenses

In addition to general University student expenses, students in the Physician Assistant Program are responsible for the purchase of their medical uniforms and diagnostic equipment, approximately $800. Microscopes are not required.

Graduate Program

Master of Science in Preventive Medicine and Environmental Health

Clinicians are now entering an era in medicine in which knowledge and skills in preventive medicine, epidemiology, research, data management, and health care administration are of great value. In recent years the scope of the physician assistant profession has broadened dramatically. Clinical opportunities have become available in specialty and subspecialty areas of medicine with an increasing utilization of physician assistants in clinical research, medical education, and health care administration.

With these trends in mind, a combined graduate level program was developed at The University of Iowa in cooperation with the Department of Preventive Medicine and Environmental Health.

The combined program is designed to provide a broad foundation in preventive medicine. The integrated curriculum is three years in length and consists of 30 semester hours of graduate courses in epidemiology, environmental health, biostatistics, and preventive medicine, and 95 semester hours of courses constituting the standard core baccalaureate curriculum of the Physician Assistant Program. Electives may be selected from a wide range of course offerings in both the preventive medicine department and other departments in the college.

Following completion of the program, students earn a B.S. degree in the Physician Assistant Program from the College of Medicine and an M.S. degree in preventive medicine and environmental health from the Graduate College.

Admission

To be considered for admission, applicants must have completed a baccalaureate degree with a minimum grade-point average of 2.70. Suggested prerequisite courses include biochemistry, biostatistics, histology, and microbiology. Satisfactory completion of the Graduate Record Examination (GRE) General Test also is required. The Office of Admissions evaluates application materials to ensure that the minimum Graduate College standards are met. The application, including test scores and copies of the transcript, is then forwarded to the department for review.

Applicants must complete both the Physician Assistant Program application and an application for admission to the Graduate College. Deadline for completed written applications is January 15.

Courses

117:1 Physician Assistant Clinical Second Year **arr.**

117:101 Seminar for Physician Assistant Students **0-3 s.h.**
Lectures, readings, and group sessions dealing with the history and development of the physician assistant profession. Open only to students in the Physician Assistant Program.

117:102 Introduction to the Medical History and Physical Examination for Physician Assistant Students **arr.**
Basic examination techniques required in clinical data gathering; concept of problem-oriented medical records reviewed and applied to obtaining an accurate health history and detecting variations from the normal state through the physical exam; students learn interviewing skills, inspection and observation, and use of medical equipment. Open only to students in the Physician Assistant Program.

117:105 Preventive Medicine for Physician Assistant Students **1 s.h.**
Introduction to epidemiology, clinical preventive medicine, occupational, environmental, and public health; emphasis on application of skills to disease control and clinical prevention. Open only to students in the Physician Assistant Program. Same as 63:105.

BIOCHEMISTRY

Head: Alan G. Goodridge
Professors: Arthur Arnone, Thomas W. Conway, John E. Donelson, Alan G. Goodridge, Rex Montgomery, Bryce V. Plapp, Peter Rubenstein, Arthur A. Spector, Lewis D. Stegink, Earle Stellwagen, Charles A. Swenson, Joseph Walder
Professors emeriti: Clarence P. Berg, George Kalnitsky, Joseph I. Routh, Genevieve Stearns, Carl S. Vestling
Associate professors: Alice B. Fulton, Gene F. Lata, Larry S. Tobacman
Assistant professors: Robert J. Deschenes, Pamela Geyer, David H. Price, Madeline A. Shea, Daniel L. Weeks, Marc S. Wold
Undergraduate degrees offered: B.A., B.S. in Biochemistry
Graduate degrees offered: M.S., Ph.D. in Biochemistry

Undergraduate Programs

See "Biochemistry" in the College of Liberal Arts section of the *Catalog*.

Graduate Programs

The Department of Biochemistry offers programs of study leading to the M.S. and Ph.D. degrees. The department also offers opportunities for qualified and interested students to pursue combined programs leading to the M.S.-M.D. or Ph.D.-M.D. (medical scientist training) degrees.

The focus of the graduate program is on the individual student. In the first year, students' educational needs are met with formal course work and tutorial research experiences that serve as the basis for selecting a thesis topic.

First-year students spend half of their time taking biochemistry courses—usually 99:241, 99:242, 99:282, and the interdisciplinary molecular biology courses 142:210 and 142:215 (see "Molecular Biology" in this section of the *Catalog* for course descriptions). Students spend the other half of their time working in three different faculty laboratories (99:261 Research Techniques), learning research techniques in the context of ongoing projects.

After the first year, students choose research laboratories for Ph.D. thesis research, begin their thesis projects, and take courses that supplement and complement their interests and preparation. In subsequent years, students must complete a minimum of 5 semester hours of credit consisting of three seminars and two short courses (1 semester hour each) in biochemistry and 6 semester hours of elective science courses offered in other departments.

After passing the comprehensive examinations toward the end of the second year, students are admitted formally to degree candidacy and concentrate on thesis work. The program culminates in the successful defense of the completed thesis work before a thesis committee.

In addition to meeting these requirements and the general ones of the Graduate College, students are expected to assist in the teaching of biochemistry for two or three semesters, as part of their training.

Throughout the program, students are associated with small seminar groups and receive close personal attention from the biochemistry faculty members who serve as research advisers.

Research Interests

The department's current research interests include the study of protein structure and function, polysaccharide structure and function, regulation of gene expression and recombination, mechanisms of protein biosynthesis and processing, membrane structure, determinants of cell shape and motility, and mechanisms of hormone action.

Facilities

Biochemistry occupies modern research quarters in the Bowen Science Building, as do the Departments of Anatomy, Microbiology, Pharmacology, and Physiology and Biophysics. Almost all the research and teaching facilities for the Department of Biochemistry are located on a single floor.

The University of Iowa central research support facilities and equipment facilitate interactions between research groups. These include the Protein Structure Facility, Electron Microscopy Facility, Fermentation

Facility, Image Analysis Facility, Laser Facility, High Field NMR Facility, Weeg Computing Center, and a High Resolution Mass Spectrometry Facility. Other facilities operated by the College of Medicine and available to biochemistry researchers include the Flow Cytometry Facility, DNA Synthesis Core Facility, Molecular Biology Core Facility, Hybridoma Facility, ESR Facility, Radiation Facility, and Cytogenetics Facility.

Individual faculty research laboratories are well-equipped for modern research, and there are many common-use laboratories, including instrument rooms, a reading room, cold rooms, tissue culture areas, preparation rooms, and a stockroom. Research is supported by staff who work in areas such as glassblowing, instrument shops, animal quarters, and photography and illustration, and by secretaries, stockroom supervisors, and a purchasing agent.

Together, the department and the central support facilities have virtually all of the equipment used in modern biochemical research, including analytical and preparative ultracentrifuges, computerized fluorescence, optical rotatory dispersion, ultraviolet-visible and rapid kinetic instruments, infrared spectrometer, amino acid analyzers, protein sequenator, peptide synthesizer, gas chromatographs, preparative high performance liquid chromatographs, liquid scintillation counters, electrophoresis equipment, instrumentation for protein X-ray crystallography, computer terminals, a number of Cary spectrophotometers, an automatic DNA synthesizer, and an automatic DNA sequencer.

In addition to the department's reading room, excellent resources are provided by the Hardin Library for the Health Sciences and the various other departmental branches of the University Libraries system and by computer access to Bibliographic Retrieval Services.

Financial Aid

Usually, all students admitted to the Ph.D. graduate program in biochemistry receive financial assistance.

Admission

The graduate program in biochemistry is sufficiently flexible to accommodate students with bachelor's degrees in any of the biological, biochemical, or physical sciences. Appropriate preparation includes one-year, college-level courses in organic and physical chemistry, biology, and physics, and mathematics through calculus. Students are expected to have had one or more introductory course in biochemistry, but those with demonstrated ability may make up deficiencies after they enroll.

Minimum requirements for admission to the department include an undergraduate grade-point average of 3.00 and an acceptable score on the verbal, quantitative, and analytical sections of the Graduate Record Examination (GRE) General Test. Candidates are more competitive if they also submit scores for the advanced examinations in chemistry, biology, or biochemistry, molecular and cell biology.

Courses

99:000 Cooperative Education Internship **0 s.h.**

99:1 Orientation and Introduction to the Field of Biochemistry **0 s.h.**
Description of the field of biochemistry and its application to other areas of basic sciences; discussion of biochemical studies, research, and careers.

99:101 Technical Writing in Biochemistry **1 s.h.**
Introduction to use of the library and computerized searches of the literature; formal aspects of writing scientific reports and criteria for evaluation of the biochemical literature. Prerequisite: 99:120, 99:130, 99:140, or consent of instructor.

99:102 Undergraduate Seminar **1 s.h.**
Techniques of oral presentations including preparation of audiovisual materials; reports over general biochemical topics and student research results; fall and spring courses are sequential and involve oral presentations of increasing complexity. Prerequisite: 99:101 or consent of instructor.

99:110 Biochemistry **3 s.h.**
Chemistry, metabolism, and molecular biology of living systems. A one-semester survey. Prerequisites: two semesters of general chemistry and one semester of organic chemistry.

99:120 Biochemistry and Molecular Biology I **4 s.h.**
Structure and function of major biological compounds, including proteins, carbohydrates, lipids, nucleic acids, and supramolecular structures; enzyme mechanisms and kinetics, membrane transport; begins a two-semester sequence that concludes with 99:130. Prerequisite: 4:121. Recommended: 4:122.

99:130 Biochemistry and Molecular Biology II **4 s.h.**
Molecular dynamics of biological systems, intermediary metabolism; information transfer in procaryotes and eucaryotes; recombinant DNA techniques; chemistry and enzymology of replication, transcription, translation, cell transformation, and regulation of gene expression. Prerequisite: 99:120.

99:135 Physical Biochemistry **4 s.h.**

99:140 Experimental Biochemistry **4 s.h.**
Quantitative and qualitative experiments on identification, fractionation, and characterization of constituents of biochemical systems; use of modern instruments and techniques for spectrophotometry, chromatography, electrophoresis, centrifugation, and radioisotope studies; emphasis on experimental design and interpretation. Prerequisites: 99:120 and 4:16.

99:151 Laboratory Techniques in Molecular Biology **4 s.h.**
Basic laboratory techniques used in molecular biology. Prerequisite: 99:130 or equivalent.

99:155 Research, Independent Study **2-6 s.h.**
Undergraduate participation in biochemical research; qualified students make arrangements with faculty members in advance of enrollment. May be taken for honors.

99:160 Biochemistry Tutorial **0 s.h.**
Introduction to biochemistry for students who have been accepted in the health science colleges. Offered summer sessions. Consent of instructor required.

99:161 Biochemistry for Dental Students **4 s.h.**
Introductory course for dental students; others admitted with consent of instructor.

99:162 Biochemistry for Pharmacy Students **4 s.h.**
Introductory course for pharmacy students; others admitted with consent of instructor.

99:163 Biochemistry for Medical Students **6 s.h.**
Introduction to analysis of clinical problems in biochemical terms. Open to medical students; others admitted with consent of instructor.

99:164 Biochemistry for Physician Assistant Students **3 s.h.**
Aspects of general biochemistry necessary for understanding the biochemical basis of human disease; analysis of appropriate clinical cases. Taught concurrently and integrated with 72:164.

99:215 Genetics Seminar **0-2 s.h.**
Lectures, discussions, seminars on selected topics in genetics. May be repeated. Prerequisite: 37:128 or consent of instructor. Same as 61:215, 2:215, 37:215.

99:220 Bioorganic Mechanisms **1-2 s.h.**

99:222 Motility and the Cytoskeleton **1-2 s.h.**

99:223 Gene Expression **1-2 s.h.**

99:226 Enzyme Kinetics **1-2 s.h.**

99:227 Proteins **1-2 s.h.**

99:228 Regulation Intermediary Metabolism **1-2 s.h.**
Regulation of central metabolic pathways. Prerequisite: 99:130 or 99:242 or consent of instructor.

99:230 Carbohydrates **1-2 s.h.**

99:237 Topics in Biochemistry **1-2 s.h.**
Discussions of a specialized area of biochemistry. May be repeated. Prerequisite: 99:130 or 99:242.

99:238 Lipids **1-2 s.h.**

99:241 Biophysical Chemistry I **1-4 s.h.**
Quantitative analyses of biochemical systems; application of thermodynamics, equilibria, spectroscopy, hydrodynamics, electrophoresis, chromatography, and X-ray crystallography to the study of the structure and function of macromolecules. Consent of instructor required. Prerequisite: one year of biochemistry. Recommended: course in physical chemistry.

99:242 Biophysical Chemistry II **1-4 s.h.**
Continuation of 99:241, which is a prerequisite; enzyme kinetics and mechanisms, macromolecular interactions and dynamics, regulatory systems.

99:261 Research Techniques **1-6 s.h.**
Laboratory rotation for first-year graduate students in biochemistry.

99:272 Seminar in Cellular and Molecular Biology **1 s.h.**
Same as 37:272, 60:272, 61:272, 71:272, 72:272.

99:282 Seminar **0-1 s.h.**
Techniques for presentation of scientific information for graduate students in biochemistry.

99:292 Research Biochemistry **arr.**
Thesis research for graduate students in biochemistry.

DERMATOLOGY

Head: John S. Strauss
Professors: Richard M. Caplan, Donald T. Downing, Kenzo Sato, John S. Strauss
Associate professors: Kathi C. Madison, Warren Piette, Thomas L. Ray, Duane Whitaker
Assistant professor: Mary S. Stone
Clinical assistant professors: Dan Bovenmyer, Thomas C. Boysen, Roger I. Ceilley, Robert F. Godwin, Susan Puhl, James E. TenBroeke

The Department of Dermatology instructs medical students and trains dermatology residents in the care of patients with skin disease. It also provides researchers with an opportunity to develop their skills in dermatology.

The UI program is one of the few in the country with a required rotation for medical students. Each third-year medical student spends two weeks in the clinic and attends about ten one-hour lectures. A good cross section of patients is available due to the mixture of private and clinic patients, including a large number referred from Student Health Service. Additional patients

are seen at the nearby Veterans Affairs Medical Center.

Various electives are available for fourth-year medical students, including further clinical experience, dermatologic research, and special studies.

Courses

62:1 Clinical Dermatology 2 s.h.
Basic dermatology for third-year medical students; lectures, independent study materials, clinical experience.

62:2 Dermatology Elective arr.
Fourth-year medical students spend four weeks in advanced clinical experience, dermatologic surgery, and special assignments.

62:4 Research in Dermatology arr.
General principles of medical research; clinical or laboratory projects; individualized study.

62:5 Dermatology Elective for Physician Assistant Students arr.

62:999 Special Studies off Campus arr.

DIETETIC INTERNSHIP

Director: Rose Ann Sippy
Internship director: Suzanne Davis Koury
Assistant internship director: Marlys Dunphy

The University of Iowa Hospitals and Clinics offers a Dietetic Internship Program that qualifies graduates to take the American Dietetic Association (ADA) registration examination. The program is fully accredited by the ADA. Clinical dietitians and food service system managers of The University of Iowa Hospitals and Clinics Dietary Department provide the clinical teaching for the program. Courses in the program are administered by The University of Iowa College of Medicine. The following courses are required:

50:201-202 Dietetics Seminar	2 s.h.
50:203-204 Clinical Dietetics	4-8 s.h.
50:205-206 Projects in Dietetics	2 s.h.
50:209-210 Hospital Dietary Administration	4-8 s.h.
69:104 Principles of Human Pathology	1 s.h.

The following are recommended electives:

50:207-208 Dietetic Research	arr.
50:216 Analysis of Food Service Systems	2 s.h.

Students generally complete the program with 13 semester hours of graduate credit. The University of Iowa Hospitals and Clinics awards a certificate to graduates of the program. Credit earned in the program may be applied toward an advanced degree. Approximately half of the graduates of the program go on to complete advanced degree programs, most typically the master's degree in preventive medicine, health education, or business administration.

American Dietetic Association and University of Iowa Graduate College requirements for admission to the program include the bachelor's degree with a strong background in food and nutrition, food service management, and basic sciences.

Students must enter the program in the fall semester. The postmark deadline for application is February 18.

The University of Iowa Hospitals and Clinics pays an internship stipend that partially covers educational and living expenses.

For descriptions of program courses, see "Nondepartmental Courses" in the College of Medicine introductory section of the *Catalog*.

FAMILY PRACTICE

Head: Charles E. Driscoll
Professors: Charles E. Driscoll, Ian M. Smith (Internal Medicine), Glenys O. Williams
Professor emeritus: Reuben B. Widmer
Associate professors: Elizabeth A. Burns, Craig L. Gjerde, David M. Rosenthal
Assistant professors: David Kearns, Ralph Knudson, Lawrence Steinkraus, George C. Xakellis
Clinical professor: R. Palmer Howard
Clinical associate professors: Gerald D. Loos, Gerald J. McGowan, Jay Mixdorf
Clinical assistant professors: Michael Abrams, Stanton L. Danielson, James H. Dunlevy, Robert L. Friedman, Corrine M. Ganske, Charles D. Huss, Michael J. Jung, Thomas W. Miller, John F. Murphy, James W. Opoien, Stephen B. Sidwell, James F. Stiles, Robert L. Swaney, Donald J. Tesdall, George J. Uhl
Associates: Cherie A. Bagley, Larry D. Beaty, Richard Dobyns, Bery Engebretsen, Patricia F. Hollingsworth, James D. Kimball, Delwyn Lassen, Ann P. Stein, Dennis J. Walter, Leslie E. Weber, Jr.

The Family Practice Program was initiated in response to the need for more primary care physicians in Iowa and throughout the nation.

Appropriate course work in the department is included throughout the four-year M.D. program. The department's 19 elective senior rotations give students opportunities for exposure to various Iowa communities through work in affiliated hospitals or connected facilities, in the department's model office on the University campus, and in preceptorships with selected family physicians throughout the state. There is also ample opportunity for independent study during the senior year, and an international health care elective offers exposure to primary health care systems of other countries.

Residency

The department directs a three-year residency program whose graduates are eligible for certification by the American Board of Family Practice. This residency trains physicians to provide continuing and comprehensive care to the total family unit, using a concept that integrates the patient, allied health professionals, and the physician into an efficient and effective health care team.

The program is flexible, allowing residents freedom to tailor training to their interests and needs. It includes a broad spectrum of electives in internal medicine, pediatrics, obstetrics and gynecology, psychiatry, medical and surgical subspecialties, and community medicine. The program currently offers 72 individual rotations.

The hospital-based clinical experience is a unique combination of exposure to practice in The University of Iowa Hospitals and Clinics, where the patients have been referred by physicians from all over the state, and in various community hospitals, where inpatient care is of a nature more typical of family practice.

During the first year, a large portion of the program is based at Mercy Hospital in Iowa City, where residents have the opportunity for total participation in the practice—both inpatient and outpatient—of the private physician staff. Rotations are specifically designed to provide breadth of experience. In the second and third years, residents spend increased time at the Family Practice Center and at The University of Iowa Hospitals and Clinics.

Facilities

The department office, located in the Steindler Building on the health center campus, is the center of department activities. It contains faculty offices and the Family Practice Model Office. Patient families are assigned to a resident with faculty supervision and are seen by appointment. Responsibility for the patient family remains with that resident for the period he or she is in the training program. Emphasis is placed on teaching the principles of practice management, including the organizational and administrative decision making, patient record and bookkeeping procedures, and chart auditing methodologies required to manage a private practice.

Courses

115:102 Human Dimensions in Medicine 1 s.h.
Weekly meeting of small groups of students for nonevaluative, noninvasive sharing; structured course lasts one semester; interested groups can continue.

115:201 Principles of Family Medicine 2 s.h.
Introduction to theory and practice of family medicine, with emphasis on clinical problems commonly seen by family physicians; the role of psychosocial factors and family function in health and disease; the social, political, and economic factors affecting the practice of family medicine; lecture and discussion format; two hours of clinical experience are offered; students complete an individual project on a subject relevant to family medicine.

115:202 Facilitation of Human Dimensions in Medicine 1 s.h.

115:205 Practical Clinical Nutrition 2 s.h.
Core knowledge, attitudes, and skills needed to fulfill nutritional needs of patients in hospital and outpatient settings; preventive and therapeutic aspects of nutrition.

115:300 Preceptorship in Family Practice 2 s.h.
One-on-one experience with a practicing physician in his or her office, an opportunity to see the practice of medicine away from the tertiary care setting; provides exposure to illnesses and conditions often seen in primary care; provides realistic background for evaluation of family medicine as a career alternative.

115:401 Family Practice Clerkship, Broadlawns Hospital, Des Moines Family Health Center 4 s.h.
Clinical experience in family medicine; includes both inpatient and outpatient care. Consent of department required.

115:402 Emergency Room Outpatient Clinic, Broadlawns Hospital, Des Moines 4 s.h.
Main objectives are to develop students' art and professionalism in delivering quality primary care, knowledge of normal human behavior in the socioeconomic environment, effects on people's behavior, diseases. Room and board provided. Consent of department required.

115:403 International Health Care 4 s.h.
Exposure to primary health care delivery systems of other countries; positions available in Great Britain, Israel, Sweden, Australia, Germany, Canada, and others; individually arranged experiences may be submitted for approval. One, two, or three months recommended. Consent of department required.

115:404 Preceptorship in Family Practice 4 s.h.
An opportunity to return to the community setting for further experience in the community practice of family medicine. Individually arranged with the consent of individual preceptor and Department of Family Practice.

115:405 Family Practice Clerkship, Cedar Rapids 4 s.h.

115:408 U of I Family Practice Rotation 4 s.h.
Delivery of primary medical care in the Family Practice Model Office, working alongside family practice residents and staff in the day-to-day delivery of patient care; students work with patients of staff physicians and are assigned their own patients; experience in the Family Stress Clinic observing family-centered counseling, nursing home visits, and work with the departmental social worker are integral.

115:409 Family Practice, Mason City 4 s.h.
Students work with selected family physicians on staff at Mercy or other affiliated community hospitals in the area, are responsible for management of all patients admitted by these physicians, participate in care rendered by all consultants involved; afternoons in family practice office provide experience in primary care. Consent of department required.

115:410 Independent Studies 4 s.h.
Students work with member of Department of Family Practice on investigation of his or her choice; study should be in field of family medicine, community medicine, health care delivery, health maintenance, or similar areas. Consent of department required.

115:411 Occupational and Agricultural Medicine 4 s.h.
Same as 63:411.

115:412 Central Nervous System Management and Rehabilitation, Covenant Medical Center, Waterloo, Iowa 4 s.h.
Students work closely with patients who have neurological problems such as quadriplegia, paraplegia, brain injury, and stroke to develop thorough understanding of multiple issues involved in brain-injury rehabilitation; at Covenant Medical Center, Waterloo, Iowa.

115:419 Family Practice Clerkship, Davenport 4 s.h.
Students are assigned problems seen most commonly in the family practice office; staff, including residents and faculty, follows students through history and physical, supports them in evaluation and diagnostic workups and treatment of each specific problem; students exposed to acutely ill patients in services of medicine, surgery, obstetrics, and pediatrics. Room and board provided. Consent of department required.

115:420 Family Practice Clerkship, Sioux City 4 s.h.
Introduction to methods used in common medical practice oriented toward family practice; students participate in care of patients seen by physicians and residents of family practice program. Room and board provided when possible. Consent of department required.

115:421 Family Practice Clerkship, Oakdale 4 s.h.
Students become members of a private group teaching practice, participate in care of patients in family care center; following completion of clerkship, students gain experience in the application of family practice concepts; Red Oak Family Care Center is the site of the Model Regional Primary Care Program.

115:424 Senior Selective in Family Practice, Waterloo 4 s.h.
Four-week rotation at the Blackhawk Area Family Practice Center; students follow patients from outpatient care through hospitalization; rotation teaches basic concepts of family practice and exposes students to the team concept in medical care.

115:425 Senior Selective in Emergency and Outpatient Care 4 s.h.
Students participate in acute emergency care and management of acute illnesses at Schoitz Memorial Hospital, Waterloo, and in follow-up care when possible.

115:426 Geriatric Medicine in Family Practice 4 s.h.
Learning modules of geriatric medicine, patient care in local community settings (family practice office, day center, nursing home, well-elderly clinic), assessment of patients at home, working in a multidisciplinary team.

115:427 Clerkship, Alcoholism Treatment Unit, Oakdale Campus 4 s.h.
Offered in the University Chemical Dependency Center Unit; students learn the philosophy of the substance abuse treatment program, become aware of community resources for the treatment of substance abuse by firsthand observation, and recognize the institute treatment for medical conditions associated with chemical dependency; students participate in daily rounds with instructor and develop primary responsibility for patients.

115:430 Emergency Medicine: Marian Health Center, Sioux City 4 s.h.
Students work with routine emergency problems in regional trauma center and study functions of area resource hospital (St. Luke's Medical Center); students may accompany ambulance crews if desired; students must be available every other weekend and evenings two days per week. Prerequisite: basic life support certification (can be arranged on arrival in Sioux City).

115:500 Family Practice Elective for Physician Assistant Students arr.

115:555 Family Practice I for Physician Assistant Students 6 s.h.
Students participate in delivery of ambulatory primary care and work under supervision of family practice residents, faculty, and/or private physicians; problems commonly encountered in ambulatory situations; study of selected patients and their families; skills of allied health professionals, efficient utilization of these personnel.

115:556 Family Practice II for Physician Assistant Students arr.

115:999 Special Studies off Campus arr.
For students who want to arrange special clerkships that may include community hospitals; completed "Summary of Individually Arranged Elective" form must be submitted eight weeks prior to beginning of rotation; minimum of four weeks should be allowed to complete the form.

GENETICS

Graduate degree offered: Ph.D. in Genetics

The Ph.D. program in genetics is an interdepartmental program involving members of the Departments of Biochemistry, Biology, Botany, Microbiology, and Physiology and Biophysics, as well as a number of faculty members in clinical departments. See "Genetics" in the College of Liberal Arts section of the *Catalog* for a list of participating faculty members, degree requirements, and courses offered.

HOSPITAL AND HEALTH ADMINISTRATION

Director: Samuel Levey
Professors: Samuel Levey, James L. Price
Professor emeritus: Gerhard Hartman
Associate professors: Robert L. Ludke, James E. Rohrer, Daniel W. Russell
Adjunct associate professor: Gary S. Levitz
Assistant professors: Mary P. Taggart, Douglas S. Wakefield
Adjunct assistant professors: Richard F. Hansen, William W. Hesson, Michael V. Reagen, John H. Staley, Kenneth H. Yerington
Associate: Peter E. Hilsenrath
Adjunct lecturers: Scott R. Anderson, Brenda M. Booth, Richard C. Breon, Raymond F. Burfeind, George B. Caldwell, Kenneth M. Courey, Jack L. Dack, K. Douglas Deck, Donald W. Dunn, Ames S. Early, Michael D. Faas, James P. Fitzgerald, Willis F. Fry, Milford S. Grotnes, Lillian M. Hallberg, C. Patrick Hardwick, James D. Helzer, Allen M. Hicks, Douglas V. Johnson, Esther Kalb, Richard S. Kowalski, Jack O. Lanier, Wayne H. Maddocks, Elizabeth T. Momany, Roger W. Moore, Thomas P. Mullon, Michael Muenzberg, Richard R. Murphy, Harlan H. Newkirk, Randall L. O'Donnell, Paul M. Pietzsch, Glenn E. Potter, David S. Ramsey, William G. Reis, Steven L. Seiler, James H. Skogsbergh, A. James Tinker, Stephen L. Ummel, David H. Vellinga, Samuel T. Wallace, Gary L. Wilkinson, Kirk G. Wilson
Graduate degrees offered: M.A., Ph.D. in Hospital and Health Administration

For more than forty years, The University of Iowa's Graduate Program in Hospital and Health Administration has educated health care executives to assume leadership roles in an increasingly complex and dynamic health care system. Consistently ranked among the foremost programs in the field, it has produced graduates who hold key positions in all areas of health management, both in the United States and abroad.

The program, which is accredited by the Accrediting Commission on Education for Health Services Administration, offers two graduate degrees—the Master of Arts (M.A.) and the Doctor of Philosophy (Ph.D.). The M.A. program meets the needs of those seeking managerial positions in health care or health-related organizations. The Ph.D. program prepares candidates for teaching or research careers, as well as senior-level executive and policy positions.

Programs

Master of Arts

The master's degree in hospital and health administration requires four semesters of full-time study. The curriculum is designed to develop the knowledge, understanding, and skills that its graduates need to succeed in responsible managerial positions in hospitals, long-term care institutions, alternative delivery systems, ambulatory care facilities, planning agencies, consulting firms, and other health-related organizations.

First-year students examine the social, political, economic, and financial aspects of hospitals and health care organizations. At the same time, they are introduced to the concepts, tools, and techniques of effective managerial decision making, planning, and control. Second-year students are exposed to advanced management concepts and techniques in areas of interest and career objectives.

Sixty semester hours of graduate work are required for the degree. Required courses, totaling 42 semester hours and representing a core of disciplines and fields of knowledge, are carefully sequenced to establish a unified approach to learning.

The 60-semester-hour curriculum includes the following required courses:

80:100 Executive Seminar Series	0 s.h.
80:101 Introduction to Health Care Organization	3 s.h.
80:201 Health Care Management	3 s.h.
80:205 Issues in Health Management and Policy	3 s.h.
80:212 Intermediate Micro-Economic Theory	3 s.h.
80:213 Health Economics	3 s.h.
80:216 Financial Management of Health Institutions	3 s.h.
80:219 Managerial Decision Support Systems	3 s.h.
80:225 Health Information Systems	3 s.h.
80:237 Legal Aspects of Health and Medical Care	3 s.h.
6N:192 Financial Accounting—M.B.A.	3 s.h.
6N:194 Managerial Finance—M.B.A.	3 s.h.
6N:196 Marketing Management—M.B.A.	3 s.h.
6N:197 Quantitative Methods—M.B.A.	3 s.h.
6N:271 Statistical Methods—M.B.A.	3 s.h.
Electives*	18 s.h.

*At least 9 of these 18 semester hours must be taken in the hospital and health administration program.

A thesis is optional for the master's degree but is recommended for students intending to pursue doctoral studies.

Aging and Long-Term Care Specialization

The specialization in aging and long-term care was developed in conjunction with The University of Iowa Aging Studies Program to respond to two trends: the growing number of elderly and the increasing use of long-term care facilities and home health care. The aging and long-term care specialization positions graduates to fill the growing demand for qualified health care executives skilled in these areas.

The aging and long-term care specialization requires 60 hours of graduate work, including all required courses plus:

Electives in hospital and health administration or aging studies*	12 s.h.
80:234 Administrative Residency in Aging and Long-Term Care**	6 s.h.

*At least 3 of these 12 semester hours must be taken within the hospital and health administration program.

**A total of 720 contact hours are required by the state of Iowa for licensure as a nursing home administrator. Residence hours may be completed throughout the program of study. The residency requirement may be satisfied during the intervening summer periods and at the conclusion of the didactic work.

H.H.A.-M.B.A. Degree Program

The H.H.A.-M.B.A. dual degree program is designed for students who want to combine the traditional strengths of the Graduate Program in Hospital and Health Administration with greater exposure to advanced management techniques.

A minimum of 72 semester hours must be earned for both degrees to be awarded. Of this number, 27 semester hours must be taken in the hospital and health administration program.

Five-Year Program

The University of Iowa was the first institution in the nation to offer a five-year program in hospital and health administration. This option, which was launched with a grant from the W.K. Kellogg Foundation, enables qualified students to complete their baccalaureate and master's degrees in five years rather than the usual six.

To be eligible for admission to this program, students must complete all general requirements for a baccalaureate degree at their undergraduate institution by the end of the summer session of their junior year.

During the senior year, students are enrolled in the program in hospital and health administration as undergraduates. After completing the first year of study, the bachelor's degree is conferred by the undergraduate institution. Students are then admitted formally to The University of Iowa Graduate College. The master's degree is conferred after completion of the second year of study.

Joint Programs

Students who wish to pursue an integrated program combining a graduate degree in hospital and health administration with that of another field are encouraged to do so. Joint programs usually require three years of full-time study, and students must satisfy the requirements of each program to earn both degrees. In addition to the M.A.-M.B.A. dual degree program, joint programs currently are offered with the College of Law (J.D.) and the Program in Urban and Regional Planning (M.A.). Other alternatives may be established on an individual basis.

Students interested in a joint program should discuss their plans with both academic units and indicate their interest when submitting application materials.

Fellowships and Residencies

Most students choose to complement their academic training with an administrative fellowship or residency. Such experiences afford a valuable means of observing, developing, and demonstrating practical management techniques and skills. The program takes an active role in assisting students to identify and secure fellowship and residency positions.

Doctor of Philosophy

The Ph.D. program, the nation's first doctoral program in hospital and health administration, prepares students to assume positions in teaching and research as well as senior policy and executive assignments. Graduates of the program demonstrate advanced capabilities in research and management that enable them to work effectively in a wide variety of health-related organizations.

The Ph.D. requires completion of a minimum of 90 graduate semester hours, comprehensive examinations, and a dissertation. Doctoral candidates prepare dissertations based on original research that tests, extends, or applies concepts or principles to a problem in health care. The program requires all doctoral students to develop expertise in three areas of study. These areas and the required courses are as follows.

Health Services Management and Policy

80:239 The Politics of Health Policy
80:251 Planning for Health Policy
80:253 Seminar: Health Systems Management
80:255 Seminar in Contemporary Health Issues I

Research Methodology and Statistics

80:261 Health Services Research I
80:262 Health Services Research II
80:263 Independent Research Project

Advanced Statistical Techniques

Doctoral students also are required to complete at least four courses in statistics (a minimum of 12 semester hours) from one of the following sequences.

General Measurement/Statistics Sequence

7P:243 Intermediate Statistical Methods
7P:244 Correlation and Regression
80:265 Application of Multivariate Statistical Methods
Elective

Econometrics Sequence

6E:221 Econometrics I
80:265 Application of Multivariate Statistical Methods
Electives

Sociology Sequence

34:214 Elementary Statistics and Data Analysis
34:216 Intermediate Statistics and Data Analysis
80:265 Application of Multivariate Statistical Methods
Elective

Minor

Students must complete at least 12 semester hours in a discipline such as sociology, political science, social psychology, management science, or economics.

Alumni Association

An active alumni association supports the program in a number of ways, including curriculum consultation, continuing education, research, and fund development. The association also functions as a network for persons entering the profession. Alumni serve as visiting faculty, consultants, and as preceptors for residencies and fellowships.

Each fall the program sponsors the Executive Symposium, a two-day conference for several hundred health care executives, featuring presentations by leaders in the health care field. This event brings together alumni, students, educators, and leaders of the health care industry to address and discuss critical issues in health care. Recent symposia have addressed the changing role of the physician, new developments in health care, the balance between business ethics and the healing mission, prospects for a new era in American health care, and leadership in health care.

Admission

Applicants to the master's program are required to hold a baccalaureate degree (except for early admission program applicants). Applicants to the Ph.D. program generally are expected to hold a master's degree in a health-related field, although other degrees will be considered. A 3.00 grade-point average (on a 4.00 scale) is required. Combined Graduate Record Examination (GRE) General Test verbal and quantitative scores above 1100 or Graduate Management Admission Test (GMAT) scores above 550 are preferred. Courses in finance, economics, and statistics are strongly recommended. All applicants are required to submit academic transcripts, GRE or GMAT scores, three letters of recommendation, and a written statement of interest in the program. Generally, admissions are made for the fall semester only. Campus visits are encouraged and personal interviews are required prior to admission.

Financial Aid

Approximately three-quarters of the students in the program receive some form of financial aid. Every effort is made to provide financial assistance to all students who demonstrate need.

In addition to various scholarship, grant, and loan programs administered by the University, the program provides qualified students with research assistantships that afford valuable experience in health services research and management projects. Research assistants work 10 to 20 hours per week and must apply for reappointment each semester. Appointment as a research assistant provides a stipend and entitles nonresident students to in-state tuition rates.

In addition to these student financial aid programs, there exist opportunities for part-time employment both on and off campus. Further information and application forms for financial aid are available from the Office of Student Financial Aid.

Center for Health Services Research

The Center for Health Services Research (CHSR), the research division of the Graduate Program in Hospital and Health Administration since 1981, is the University wide focal point for a broad-based program of health services research.

With the coordination and support of the CHSR, faculty and staff from colleges and departments throughout the University investigate the organization, delivery, efficacy, and financing of health care services. CHSR interests embrace a broad spectrum of perspectives and disciplines, including management science, health care organization, economics, geography, organizational behavior, psychology, operations research, sociology, preventive medicine and environmental health, preventive and community dentistry, nursing, and clinical medicine.

Through its research activities, the center promotes links among health organizations throughout the Midwest. CHSR also fosters frequent exchanges with professional and provider associations, policy and planning groups, insurance organizations, health delivery institutions, and other members of the health services research community.

As the driving force behind the formation of the Health Services Research Consortium, the center has developed affiliations with the Veterans Affairs Health Services Research and Development Field Program, the Mercy Consortium for Health Services Research, and the National Institute for Rural Health Policy.

Master's and doctoral students from the program are encouraged to become involved in the center's projects and activities.

Courses

80:100 Executive Seminar Series **0 s.h.**
Executives and medical specialists from academic health centers, health-related associations, multihospital systems, government agencies, health maintenance organizations, community hospitals, and the health insurance industry address current issues and topics affecting the health care industry.

80:101 Introduction to Health Care Organization **3 s.h.**
Basic organizational arrangements of health services in the United States; analysis of social, political, psychological, and economic forces that shape health services; determinants of utilization, amounts and types of health resources available, methods of financing, government regulation, current issues. Same as 63:181.

80:201 Health Care Management **3 s.h.**
Application of basic management principles such as leadership , goal setting, decision making, and human resource management in health care organizations; first in a sequence.

80:202 Hospital Organization and Management **3 s.h.**
Introduction to hospital operations and management; emphasis on governance, medical staff organization, and departmental operations. Prerequisite: 80:201.

80:203 Strategic Management of Health Care Organizations **3 s.h.**
Nature and application of strategic management in the health field; students research and develop oral and written presentations on timely health management issues and conduct projects in selected facilities. Prerequisite: 80:201.

80:205 Issues in Health Management and Policy **3 s.h.**
Integration of theories, concepts, and principles; application through analysis and discussion of case studies. Prerequisite: 80:201.

80:206 Management of Alternative Delivery Systems **3 s.h.**
Organization and management of HMOs and PPOs; emphasis on managed care programs and utilization management techniques. Prerequisite: 80:201 or consent of instructor.

80:207 Group Practice and Ambulatory Care Administration **3 s.h.**
Focus on the delivery of ambulatory health care services, including review of for-profit and not-for-profit organizations; emphasis on manpower education and training, personnel administration, clinic scheduling, managerial accounting, and other internal issues. Prerequisite: 80:201.

80:208 Long-Term Care Administration **3 s.h.**
Problems of health care delivery for the elderly and those with functional disabilities; analysis of proposals for federal payment programs and issues related to providing care for the chronically ill. Prerequisite: 80:201.

80:209 Readings on Ownership of Health Care Institutions **3 s.h.**

80:212 Intermediate Micro-Economic Theory **3 s.h.**
Theory of consumer and firm behavior; market structures; factor markets; introduction to welfare economics, public economics, and decision making under uncertainty; examples from the health care sector. Consent of instructor required.

80:213 Health Economics **3 s.h.**
Application of microeconomic analysis to the health care sector: markets for medical and hospital care; health insurance; physician supply; medical education; malpractice; emphasis on public policy. Prerequisite: 80:212 or consent of instructor.

80:216 Financial Management of Health Institutions **3 s.h.**
Issues in working capital management, capital financing, cost analysis and rate setting, budgeting, reimbursement, internal control mechanisms and financial management information systems; emphasis on uses of information from accounting and financial management systems.

80:217 Topics in Health Insurance **3 s.h.**
Currents topics in financing personal health care: theory of insurance, the health insurance market, cost sharing, HMOs, PPOs, public and catastrophic health insurance, AIDS and insurance, care for the uninsured poor; emphasis on public policy. Prerequisite: 80:212 or consent of instructor.

80:219 Managerial Decision Support Systems **3 s.h.**
Development and application of decision support systems for health care managers; issues and methods involved with development of databases; decision making under different environmental assumptions; role of managers in decision making; use of quantitative and qualitative decision-making aids.

80:225 Health Information Systems **2-3 s.h.**
Introduction to use of computers in management of health care organizations; application of systems concepts to the planning, design, implementation, and evaluation of computer-based health information systems; managerial communication for the health care executive.

80:234 Administrative Residency **arr.**

80:237 Legal Aspects of Health and Medical Care **3 s.h.**
Analysis of statutory and common law frameworks applicable to the health care system; court decisions illustrate applications of general legal doctrines in hospital and health settings. Consent of instructor required.

80:238 Sociology of Health **3 s.h.**
Concepts of health and disease; individual and societal reactions to illness and deviance; sociocultural factors

affecting help-seeking behavior and medical practice; psychosocial dimensions of caring for the sick; sociological perspectives on the organization of medical services. Consent of instructor required.

80:239 The Politics of Health Policy **3 s.h.**
Processes by which public policies affecting health are generated, promoted, opposed, adopted, and implemented; emphasis on political analysis of who gets what in the health policy area, and how they get it. Consent of instructor required. Prerequisite: 80:101 or equivalent.

80:251 Planning for Health Policy **3 s.h.**
Development of conceptual framework and empirical base for analyzing organization and delivery of medical care; evaluation of literature and policy regarding accessibility, productivity, program benefits, quality, assessment of need and supply. Consent of instructor required. Prerequisite: 80:101 or equivalent.

80:253 Seminar: Health Systems Management **arr.**
Case studies highlighting management as the primary integrative force in health organizations; major areas of executive action in the development of policy, organization, planning, information systems, and control. Prerequisite: 80:251.

80:255 Seminar in Contemporary Health Issues I **arr.**
Selected issues in health care organization, financing, and delivery. Prerequisite: 80:251.

80:256 Seminar in Contemporary Health Issues II **arr.**
Continuation of 80:255, with different selected issues.

80:261 Health Services Research I **3-4 s.h.**
Fundamentals of problem formulation, design, and methodology; emphasis on evaluation of health systems. Consent of instructor required.

80:262 Health Services Research II **3-4 s.h.**
Continuation of 80:261, which is prerequisite; students required to defend a research protocol.

80:263 Independent Research Project **arr.**
Continuation of 80:262, which is prerequisite; students design, conduct, and complete a research project under faculty supervision.

80:265 Application of Multivariate Statistical Methods **3 s.h.**
Multivariate statistical methods and their application in health services research; emphasis on use of computer software packages. Prerequisite: 80:262.

80:280 Independent Study and Research **arr.**
Arrangements may be made for a supervised tutorial course on a special subject. Consent of instructor required.

80:285 Ph.D. Dissertation **arr.**
Individual research under faculty supervision for the preparation of the doctoral dissertation; doctoral candidates required to present seminars in their areas of research. Consent of instructor required.

HUMAN NUTRITION

Director: Ekhard E. Ziegler
Professors: Mark L. Armstrong (Internal Medicine), Robert S. Bar (Internal Medicine), Edward F. Bell (Pediatrics), Michael J. Brody (Pharmacology), C. Patrick Burns (Internal Medicine), George D. Cain (Biology), Kevin P. Campbell (Physiology and Biophysics), Robert A. Clark (Internal Medicine), P. Michael Conn (Pharmacology), John E. Donelson (Biochemistry), Samuel J. Fomon (Pediatrics), Alan G. Goodridge (Biochemistry), James W. Hanson (Pediatrics), Lawrence G. Hunsicker (Internal Medicine), C. Thomas Kisker (Pediatrics), Ronald M. Lauer (Pediatrics), John P. Long (Pharmacology), Frank J. Longo (Anatomy), Allyn L. Mark (Internal Medicine), Edward E. Mason (Surgery), Rex Montgomery (Biochemistry), Arthur Nowak (Pediatric Dentistry/Pediatrics), William J. Rhead (Pediatrics), Jean Robillard (Pediatrics), Peter A. Rubenstein (Biochemistry), Harold P. Schedl (Internal Medicine), Arthur A. Spector (Biochemistry/Internal Medicine), Lewis D. Stegink (Pediatrics/Biochemistry), John B. Stokes (Internal Medicine), Robert B. Wallace (Preventive Medicine and Environmental Health/Internal Medicine), Ekhard E. Ziegler (Pediatrics)
Associate professors: F. Jeffrey Field (Internal Medicine), Alice B. Fulton (Biochemistry), Carolyn W. Lara-Braud (Home Economics), Gene F. Lata (Biochemistry), Victoria S. Lim (Internal Medicine), Donald M. Mock (Pediatrics), Jeffrey C. Murray (Pediatrics), Jeffrey E. Pessin (Physiology and Biophysics), Charles J. Rebouche (Pediatrics), Alexander Sandra (Anatomy), Thomas J. Schmidt (Physiology and Biophysics), Helmut G. Schrott (Preventive Medicine and Environmental Health/Internal Medicine), Eva Tsalikian (Pediatrics), Joel V. Weinstock (Internal Medicine), John A. Widness (Pediatrics)
Assistant professors: Sylvain Chemtob (Pediatrics), Lawrence P. Karniski (Internal Medicine), Kenneth A. Lombard (Pediatrics), Marc S. Wold (Biochemistry)
Graduate degree offered: Ph.D. in Human Nutrition

The goal of the doctoral program in human nutrition is to train individuals for careers in research and teaching. Most individuals who complete this training find employment as faculty members of medical centers, departments of nutrition in schools of public health, various governmental agencies, or industry. Students accepted into the program without previous graduate training devote approximately five years to acquiring the necessary breadth in biomedical education, laboratory methodology, use of animal models for study of human problems, and experimental design for clinical investigation.

Course work is arranged to permit students to be involved in research throughout each semester. During the first 24 to 36 months of the training program, students rotate through three research laboratories. It is anticipated that students eventually will choose to perform thesis research in one of these laboratories. The five-year training program permits intensive research during the last three years.

Each student must take 43 hours of course work from the following required and elective courses.

Required Courses:

60:205 General Histology for Graduate Students (or 142:220 Cell Biology I)	4 s.h.
63:161 Introduction to Biostatistics	3 s.h.
63:162 Design and Analysis of Experiments in the Biomedical Sciences	3 s.h.
65:213 Nutrition Methods	2 s.h.
65:204 Clinical Nutrition	4 s.h.
65:203 Clinical Nutrition	4 s.h.
65:201/202 Nutrition Seminar	2 s.h.
72:212 Medical Physiology	6 s.h.
99:163 Biochemistry for Medical Students (or 99:120 Biochemistry and Molecular Biology I and 99:130 Biochemistry and Molecular Biology II)	6 s.h.

Elective Courses

63:158 Principles of Epidemiology	3 s.h.
69:203 Introduction to Human Pathology	3 s.h.
77:224 Radioisotopes in Biological Research	4 s.h.
142:220 Cell Biology I	3 s.h.
142:225 Cell Biology II	3 s.h.
142:210 Molecular Biology I	3 s.h.
142:215 Molecular Biology II	3 s.h.
61:147 Survey of Immunology	4 s.h.

Admission

The Ph.D. Program in Human Nutrition attracts students with a wide range of interests and training. Prerequisites for admission to the program include completion of acceptable courses in college-level biology, mathematics through calculus, organic chemistry, and physics; a minimum undergraduate grade-point average of 3.20 (on a scale where A = 4.00) with a 3.20 average in science and mathematics courses; and an acceptable score on the verbal, quantitative, and analytical sections of the Graduate Record Examination (GRE).

Individuals interested in further details of the program may write to the director. Formal application requires submission of all college-level grade transcripts, a letter expressing career goals, and letters of recommendation from three individuals familiar with the applicant's academic record.

Facilities

Students accepted into the program can participate in a wide range of nutrition research activities carried out in a number of departments, including anatomy, biochemistry, biology, internal medicine, pediatrics, pediatric dentistry, pharmacology, physiology and biophysics, preventive medicine and environmental health, and surgery.

Financial Aid

Financial support is available to all students in the program.

Courses

65:201 Nutrition Seminar **1 s.h.**
Student presentations of research projects. Offered fall semesters.

65:202 Nutrition Seminar **1 s.h.**
Student presentations of research projects. Offered spring semesters.

65:203 Clinical Nutrition **4 s.h.**
Energy, specific nutrients, nutrient-nutrient and drug-nutrient interactions, selected aspects of food technology, dental health; emphasis on nutrition of normal individuals.

65:204 Clinical Nutrition **4 s.h.**
Assessment of nutritional status, age- and sex-specific considerations, common clinical disorders, formula diets, parenteral nutrition.

65:205 Projects in Nutrition **arr.**

65:206 Projects in Nutrition **arr.**

65:207 Nutrition Research **arr.**

65:208 Nutrition Research **arr.**

65:213 Nutrition Methods **2 s.h.**
History of nutrition research; animal models—selection,

environmental factors, diets, feeding methods, sample collection, body composition; human subjects—ethics, dietary intake, metabolic balance studies, indirect measurements of body composition, compliance. Offered fall semesters.

INTERNAL MEDICINE

Head: Francois M. Abboud
Professors: Francois M. Abboud, Mark L. Armstrong, Robert F. Ashman, Robert S. Bar, George N. Bedell, C. Patrick Burns, James Christensen, Robert A. Clark, James A. Clifton, Richard L. DeGowin, Gerald F. DiBona, John W. Eckstein, Annette E. Fitz, Gordon D. Ginder, Donald D. Heistad, Kenneth A. Hubel, Gary W. Hunninghake, Lawrence G. Hunsicker, John E. Kasik, Richard E. Kerber, Douglas R. LaBrecque, Allyn L. Mark, Hal B. Richerson, Harold P. Schedl, Phillip G. Schmid, D. Michael Shasby, David J. Skorton, Ian M. Smith, John B. Stokes III, Robert W. Summers, Ernest O. Theilen, Michael J. Welsh, Richard P. Wenzel, Donald C. Zavala
Professors emeriti: Richard D. Eckhardt, Lewis E. January, Paul M. Seebohm, William M. Spear
Associate professors: Zuhair K. Ballas, Donald D. Brown, Joseph D. Brown, Thomas B. Casale, Gerald H. Clamon, John S. Cowdery, Peter Densen, Robert B. Felder, David W. Ferguson, Robert B. Fick, Jr., F. Jeffrey Field, David C. Funk, Roger D. Gingrich, Nancy E. Goeken, David G. Harrison, Charles M. Helms, Lawrence P. Karniski, Robert W. Karr, Michael G. Kienzle, Louis V. Kirchhoff, William J. Lawton, Victoria S. Lim, Donald E. Macfarlane, John H. MacIndoe, Stephen E. McGowan, James B. Martins, R. Michael Massanari, Charles R. McKay, Pope L. Moseley, William M. Nauseef, Charles B. Riggs, Jr., Janet A. Schlechte, Konrad S. Schulze, M. Paul Strottmann, Larry S. Tobacman, John M. Weiler, Joel V. Weinstock, Michael D. Winniford **Associate professor emerita:** Jeanne M. Smith
Assistant professors: John A. Bertolatus, Bradley E. Britigan, Timothy W. Brotherton, Linda J. Burns, David Chappell, Jeffrey L. Conklin, Kevin Dellsperger, Elizabeth H. Field, John F. Fieselmann, Joel A. Gordon, Maleah Grover-McKay, David D. Gutterman, Stephen L. Hempel, Douglas B. Hornick, Frederick C. Johlin, Jr., Jeffrey A. Kern, Hon-Chi Lee, William L. Lowe, Jr., Michael J. Muirhead, Stanley J. Naides, Garry A. Neil, Mary D. Nettleman, Michael W. Peterson, John W. Rachow, Robert F. Rea, George E. Revtyak, James D. Rossen, David A. Schwartz, Ross F. Siemers, William I. Sivitz, Edy E. Soffer, Robert G. Spanheimer, Jack T. Stapleton, Byron F. Vandenberg, David H. Warden, George J. Weiner, Mary E. Wilson
Adjunct assistant professors: Mark W. Chapleau, Frank M. Faraci, Ulla C. Kopp, Kathryn G. Lamping, Donald D. Lund, William G. Mayhan, Mark A. Yorek
Associates: Martin P. Ambrose, Randall T. Davis, Robert Dreicer, Cheryl Emmons, Michael J. Flanigan, James G. Glauber, Ellen E. Gordon, Robert J. Hegeman, Loreen A. Herwaldt, James R. Hopson, James H. Hunter, Sheldon M. Kahn, Susan K. Kambhu, Elizabeth F. Kern, Marta M. Little, Mary D. Lupinetti, Robert K. Merchant, Richard R. Olson, James E. Radford, Nowarat Songsiridej, Louise H. Sparks, Robert G. Stenberg, Joanne K. Tobacman, Gary W. Varilek, Robert M. Weiss, Jeff S. Wilson, Rodney R. Zeitler
Clinical professor: Edwin L. Overholt
Clinical associate professors: Oscar C. Beasley, Robert H. Caplan, M. Craig Champion, Vincent Fiorica, Russell D. Glynn, Nathan Josephson, Udaya M. Kabadi, Karl Larsen, Erling Larson, Edwin A. Motto, Thomas R. Nichnish, William C. Rosenfeld, C.E. Schrock, Jaleel Siddiqui, George Spellman, Lawrence F. Staples, Richard B. Trimble, Chad Williams, Javad Yans
Clinical assistant professors: Saramma J. Alexander, Daniel P. Allen, Dale J. Andringa, Lynda A. Baker, John T. Baller, Rahim M. Bassiri, Walter W. Bate, Byron T. Beasley, Michael S. Brooks, Thomas M. Brown, Jr., Michael S. Chandra, Prem K.G. Chandran, Steven R. Craig, Steven Eyanson, James E. Feeley, C. Thomas Flynn, Brent F. Gerleman, Magdi G.H. Ghali, Jon D. Gibson, James L. Gilliland, Adam J. Glazier, Jr., David F. Gordon, Philip A. Habak, Richard R. Hankenson, Randall R. Hanson, Gregory A. Hicklin, A. Clark Hyden, Liberato A. Iannone, Charles C. Larson, Samuel P. Kumar, David K. Lemon, John W. Olds, Hee-Chul Park, James G. Piros, Edward Posner, George L. River, Craig A. Shadur, Joseph D. Thoreson, Douglas Vickstrom, Vichit Viturawong
Clinical instructors: Milton F. Austin, Philip A. Bear, Philip J. Dahlberg, Wilson L. Davis, Jr., James E. Glasser, Thomas B. Hakes, Rudolph M. Keimowitz, Jack M. Lockart, Kermit L. Newcomer, Mark W. Purtle, Deanna L. Questad, Mary A. Radia, Peter T. Silberstein, Edward VanBramer, James G. Wilde, Edward R. Winga, Thomas L. Zurbriggen
Associate research scientists: Lea M. Ingraham, Donald D. Lund, Satya Mathur, Gloria N. Sando
Assistant research scientists: Mark W. Chapleau, Frank M. Faraci, Glenna L. Fry, Russell F. Husted, Kathryn G. Lamping, Benet J. Pardini, Linda G. Snetselaar

The Department of Internal Medicine is concerned with the diagnosis, prevention, and treatment of diseases of adults. The educational, patient care, and research activities of the department cover all facets of internal medicine, including general internal medicine and primary care as well as the specialized areas of allergy-immunology, cardiology, clinical epidemiology, clinical pharmacology, oncology, endocrinology, pulmonary medicine, gastroenterology, hematology, infectious diseases, renal and hypertensive disease, and rheumatology. The department is organized into divisions in order to carry out these many functions.

Members of the department bear a major share of the teaching of second-year medical students in 50:111 Introduction to Clinical Medicine, in which students begin to learn the pathophysiology, signs, symptoms, complications, prevention, and treatment of disease. Students are taught to obtain histories, perform physical examinations, and plan a rational approach to diagnosis and treatment.

In the third year, students are assigned for nine weeks to medical services at The University of Iowa Hospitals and Clinics and the Veterans Affairs Medical Center. Under the guidance of the Department of Internal Medicine house staff and faculty members, they actively participate as members of the ward team in diagnosis and treatment.

In the fourth year, students may select a clinical experience to fit their own plans from courses offered in general medicine and the specialties.

Graduate Program

The department offers straight internships and an approved residency program of high quality. In addition, most of the department's specialty divisions offer clinical and research fellowships for periods of two to three years. These permit the development of special knowledge and skills relevant to the specialty. Candidates for internships are accepted from approved medical schools. Postdoctoral fellows who have received their doctorates also are accepted for programs in which the major focus is laboratory research.

Facilities

Teaching occurs in the medical services and in the laboratories of The University of Iowa Hospitals and Clinics in Iowa City, the Veterans Affairs Medical Centers in Iowa City and Des Moines, and Iowa Methodist Hospital in Des Moines.

Courses

78:100 Internal Medicine Elective for Physician Assistant Students arr.

78:101 Clinical Internal Medicine arr.
Open only to juniors.

78:110 Internal Medicine Cardiology Elective for Physician Assistant Students arr.

78:130 Internal Medicine Elective (EKG) for Physician Assistant Students arr.
Experience in reading electrocardiograms under supervision of the cardiovascular division staff, interpreting cardiac arrhythmias, and performing and evaluating EKG stress tests. Open only to seniors.

78:150 Internal Medicine Elective (Oncology) for Physician Assistant Students arr.
Diagnostic skills in clinical oncology, methods of staging common cancers, principles and practice of rational chemotherapy; students assist in therapy and outpatient management of patients with solid tumors, lymphomas, and chronic leukemias. Open only to seniors.

78:180 Internal Medicine Elective (Geriatrics) for Physician Assistant Students arr.
The broad spectrum of medical conditions relevant to the elderly; health evaluation of patients 70 years of age or older in the Internal Medicine Service and Geriatric Clinic; visits to nursing homes and community service agencies; follow-up home visits to selected patients. Open only to seniors.

78:201 General Medicine Diagnostic Clinic arr.
Assignment for five days per week to general diagnostic clinic; clinical evaluation of medical problems; emphasis on diagnosis and management of common medical problems presented to internist in practice, as well as aspects such as management of office practice, prescreening of patients, and computerization in ambulatory health care.

78:208 Clinical Pharmacology Seminar Series 1 s.h.
Reviews of timely therapeutic subject matter. Consent of instructor required. Prerequisite: Ph.D. or M.D. or graduate training in pharmacology/therapeutics. Same as 71:208.

78:250 Clinical Allergy Immunology arr.
Emphasis on experience in diagnosis and treatment of problems in allergy and immunology; outpatients and inpatients evaluated by students under staff supervision; participation in interpretation of special studies carried out in allergy laboratory; subsequent correlation with specific clinical problems.

78:251 Survey of Immunology 4 s.h.
Lectures, discussions, and demonstrations in basic principles of immunology and immunopathology. Same as 61:147.

78:253 Clinical Immunology and Immunopathology: Laboratory and Clinical Correlations 4 s.h.
Same as 69:249.

78:290 Research in Allergy Immunology arr.
Faculty-directed investigations in one or more areas chosen from those with which instructors are identified.

78:300 Clinical Cardiology arr.
Development of breadth and depth in diagnostic and therapeutic problems encountered in clinical cardiology; participation in evaluation and decisions regarding patients seen in coronary and intensive care units, in-house consultations, and Cardiovascular Clinic; familiarity with techniques and regimens of managing acute myocardial infarction, pre- and postoperative conditions, and chronic states seen in postoperative patients during clinic follow-up visits.

78:304 Electrocardiography arr.
Instruction in scalar electrocardiography and vectorcardiography and in exercise studies including submaximal treadmill testing; activities include initial interpretation of current tracings, daily conferences with staff for review of interpretations and for instruction in fine points of analysis and interpretations, treadmill studies in cooperation with a cardiac fellow working in that area.

78:306 Cardiac Intensive Care Medicine arr.
Students function as subinterns in the coronary care unit and are responsible for evaluation and management of patients; in-depth clinical and didactic exposure to critical care medicine.

78:310 Clinical Cardiology: VA Hospital, Des Moines arr.
Work on medical service under supervision of instructors in cardiac disease; experience in electrocardiography and consultations in cardiovascular disease; work under supervision in cardiac and pacemaker clinics of coronary care-intensive care units.

78:320 Clinical Cardiology, Iowa Methodist, Des Moines arr.

78:325 Clinical Cardiology Coronary Care Experience, Iowa Methodist, Des Moines arr.

78:380 Clinical Pharmacology and Therapeutics Lecture Series 2 s.h.
Open only to seniors, or to juniors with consent of instructor. Same as 71:380.

78:400 Clinical Endocrinology arr.
Evaluation of new patients and inpatient referrals; returning patients seen in diabetes and endocrine clinics; students complete patient evaluations and prepare charts; active participation in clinical conferences.

78:401 Clinical Diabetes arr.

78:410 Endocrinology and Metabolism: VA Hospital, Des Moines 4 s.h.

78:440 Endocrine Research arr.
At least 12 weeks required, preferably six months to a year; participation in all organized educational activities of the division, as well as any portion of clinical activities that seem suitable; assignment to research laboratory of senior staff member and participation in an ongoing project. Consent of instructor required.

78:445 Hospital Epidemiology 4 s.h.

78:450 Clinical Gastroenterology arr.
Assignment primarily to the consultation service at The University of Iowa Hospitals and Clinics or the Veterans Affairs Medical Center; students assist in diagnostic procedures that will be performed for patients they have examined as part of the consultation service; at the Veterans Affairs Medical Center, they participate in the follow-up of patients through the weekly return clinic.

78:490 Research in Gastroenterology arr.
Consent of instructor required.

78:501 Oncology arr.
Diagnostic skills in clinical oncology; methods and value of clinical staging of lymphomas and solid tumors; principles and practice of rational chemotherapy; outpatient follow-up and management of patients with lymphomas and solid tumors.

78:502 Clinical Hematology arr.
Diagnostic skills in hematology; practical approaches to anemia, blood coagulation, and leukemia; bone marrow preparations; principles and practice of rational therapy for hematological disorders.

78:550 Clinical Infectious Disease arr.
Diagnosis, treatment, follow-up, and study of patients with infectious diseases, under staff guidance; students learn techniques of diagnostic microbiology and participate in conferences and teaching activities of section.

78:553 Internal Medicine Elective (Hospice) for Physician Assistant Students arr.
Introduction to philosophy and methods of hospice palliative care to the dying patient; work as part of a hospice care team; students evaluate patients with terminal illnesses and interact with physicians, other health team members, patients, and families to deal effectively with the prospect of death; evaluation, treatment, and education of people affected by the HIV virus.

78:554 Internal Medicine Elective (Infectious Disease) for Physician Assistant Students arr.
Infectious diseases and the host's reaction to disease processes; diagnosis and management of patients with infectious diseases, including proper use of antibiotics; techniques of diagnostic microbiology; students evaluate and follow up patients seen on the consult service and participate in daily clinical rounds.

78:555 Internal Medicine for Physician Assistant Students arr.

78:590 Research in Infectious Disease arr.
Research topics: rural infections, influenza infections in mice, experimental antibiotic study, staphylococcal infections in mice, experimental infections and biochemistry in tissue culture, septicemia and fungal infections. Consent of instructor required.

78:600 Pulmonary Disease arr.
Emphasis on acquiring breadth and depth in diagnostic and therapeutic problems encountered in clinical pulmonary disease; students evaluate outpatients and inpatients under supervision of staff, participate in interpretation of special studies carried out in pulmonary function laboratory and fiberoptic bronchoscopy and brush biopsy of lung, and are exposed to diagnosis and management of acute respiratory failure in intensive care units at The University of Iowa Hospitals and Clinics and Veterans Affairs Medical Center.

78:601 Research in Pulmonary Disease arr.
Faculty-directed investigations into one or more areas chosen from clinical pulmonary physiology, biopsy procedures in lung disease, pulmonary pathology, metabolic behavior of mycobacterium tuberculosis, and/or various projects in clinical pharmacology. Consent of instructor required.

78:602 Medical Intensive Care Unit arr.

78:603 Pulmonary Disease Medical Intensive Care Unit VA 4 s.h.

78:604 Pulmonary Disease University Hospital Ward Rotation 4 s.h.

78:605 Internal Medicine Elective (Pulmonary) for Physician Assistant Students arr.
Diagnostic skills in pulmonary medicine and acquaintance with the wide variety of acute and chronic lung diseases; interpretation of pulmonary function studies and arterial blood gas analysis, assistance with pleural biopsies, thoracentesis, intubations, and tube thoracostomies; one-on-one teaching emphasized. Open only to seniors.

78:610 Pulmonary Disease at the Des Moines Veterans Administration Medical Center arr.

78:615 Pulmonary Inpatient Ward, Iowa Methodist, Des Moines arr.
Students diagnose and treat pulmonary diseases according to standard procedures; students work up new pulmonary inpatients and are responsible for them under the supervision of senior residents and staff; participation in teaching conferences.

78:620 Clinical Pulmonary Disease, Iowa Methodist, Des Moines arr.

78:650 Nephrology arr.
Patients evaluated from inpatient service of The University of Iowa Hospitals and Clinics, Veterans Affairs Medical Center, and from clinics; emphasis on relatively early kidney disease and all varieties of hypertension; arrangements made to allow special emphasis on certain aspects of this broad program, and for short-term clinical studies.

78:651 Clinical Nephrology: VA Hospital, Des Moines arr.

78:652 Clinical Nephrology: Iowa Methodist Hospital, Des Moines 4 s.h.

78:653 Adult and Pediatric Nephrology and Hypertension arr.
Same as 70:653.

78:662 Medical and Pediatric Endocrinology arr.
Same as 70:662.

78:690 Research in Renal, Hypertension, and Electrolyte Disorders arr.
Elective; stresses laboratory investigation focusing on renal physiology; participation in ongoing research involving large and small animals, using classical clearance methodology for studying aspects of sodium metabolism and the influence of drugs. Open only to seniors.

78:700 Clinical Rheumatology arr.
Clinical feature of various rheumatic diseases, their differential diagnosis, and principles of management; patients seen from arthritis clinic, inpatient consultation service of The University of Iowa Hospitals and Clinics, and Veterans Affairs Medical Center.

78:720 Clinical Rheumatology, Iowa Methodist, Des Moines arr.

78:800 Internal Medicine Geriatrics arr.
Students help monitor and evaluate the health of patients 75 and older on University Hospitals' internal medicine service; emphasis on diseases that occur most commonly or exclusively in the elderly.

78:803 Aging Over Thirty and Especially Over Sixty-Five 1 s.h.
Develops understanding of gerontology (normal aging) and geriatrics (diseases of the elderly) and how they interact, with the goal of improving the quality and enjoyment of life over age 30.

78:805 Geriatrics Seminars 1 s.h.

78:832 Introduction to Medical Psychiatry 2 s.h.
Same as 73:32.

78:835 Senior Clinical Clerkship in Medical Psychiatry 4 s.h.
Same as 73:835.

78:901 Office Practice of Internal Medicine arr.
Work with an internist who is a member of the Iowa Clinical Society of Internal Medicine; students obtain histories and perform physical examinations and, with the internist, decide on proper course of diagnosis and management; focus on office practice of internal medicine; possible rounds at the hospital with preceptor.

78:902 General Medicine: Gundersen Clinic, La Crosse, Wisconsin arr.

78:903 General Internal Medicine, Keokuk, Iowa 4 s.h.

78:910 Inpatient Ward Service: VA Hospital, Des Moines arr.

78:915 Inpatient Service, Iowa Methodist, Des Moines arr.

78:996 Senior Honors Program: Research on Campus arr.

78:997 Senior Honors Seminar in Medicine 1 s.h.
Intensive study and discussion of clinical problems, scholarly work designed and completed by students, and academic career patterns in internal medicine. Open to seniors in internal medicine honors program.

78:998 Special Study on Campus: Clinical Medicine arr.

78:999 Special Study off Campus: Clinical Medicine arr.
Individually arranged by student with approval of department.

MEDICAL SCIENTIST TRAINING PROGRAM

Director: Robert E. Fellows (Physiology and Biophysics)
Associate director: William Johnson (Microbiology)
Associate director for clinical studies: Janet A. Schlechte (Internal Medicine)

The Iowa Medical Scientist Training Program is a combined M.D./Ph.D. degree program that prepares trainees for careers in academic medicine, with emphasis on preclinical and clinical research. To accomplish this, the program provides a means for efficient integration of graduate education, doctoral research training, and all clinical studies necessary for the medical degree. With few exceptions, requirements for both the M.D. and Ph.D. degrees can be completed in six to seven years of continuous study.

In the first two years of the program, trainees are associated primarily with the College of Medicine for the basic science and introductory clinical portions of its curriculum. The basic science core of the first three semesters consists of formal courses in biochemistry, histology, anatomy, embryology, biostatistics, physiology, microbiology, neuroscience, general and systemic pathology, pharmacology, and preventive medicine. These courses provide the language and organizing concepts of the preclinical sciences that are the foundation for subsequent training in both research and clinical medicine.

During the summer between the first and second years, trainees engage in research under the supervision of a member of the program faculty. Entering trainees also may choose to do research during the summer before their first year.

In the second semester of the second year, trainees enroll in an introduction to clinical medicine sequence that provides instruction and practice in medical history taking, physical diagnosis, and laboratory diagnosis, as well as insight into major health problems. In the summer of the second year, they engage in 12 weeks of clinical clerkships involving primary patient care. This early clinical component integrates scientific and clinical aspects of the program and provides an overview of research needs in the health care system. Trainees maintain contact with clinical medicine during the graduate phase of the program through participation in weekly clinical conferences and voluntary clinical activities.

Years three through five—and if necessary, six—compose the graduate phase of the program. Trainees enroll full-time in the graduate departments they selected in the middle of the second year. This graduate phase is designed to prepare trainees for careers as independent investigators. Graduate training is supervised by departmental faculty and is pursued with the rigor and standards applied to all doctoral students at The University of Iowa.

Third-year trainees take advanced courses while defining their selection of a thesis problem and adviser. With completion of the necessary qualifying examinations, trainees focus on original research, the essential requirement for the doctoral degree. While it is not possible at the outset to predict the amount of time this segment of the program will require, most trainees complete the Ph.D. research and thesis defense in three to four years.

Immediately after completing graduate study, trainees reenter the College of Medicine curriculum to begin the final year of clinical clerkships. They return to the clinical environment with a wealth of information and sophistication in laboratory science that can be applied to problems of human disease, and as the final year progresses, they renew and develop the clinical training they began in the second year of the program. After completing this clerkship year, trainees receive the M.D. and Ph.D. degrees.

Financial Aid

Trainees admitted to the first year of the program receive stipend and tuition awards provided by a Medical Scientist Training Program grant from the National Institutes of Health (NIH) to The University of Iowa. Support from this grant and/or institutional sources is continued for up to six years, provided the trainee's achievement and progress remain satisfactory. Support for trainees admitted to advanced standing in the program is arranged on an individual basis.

Admission

Applicants must meet requirements for admission to the College of Medicine and the Graduate College at The University of Iowa. Trainees are expected to have completed requirements for a bachelor's degree at an accredited academic institution. In addition to outstanding academic credentials, including strength in biological, physical, and mathematical sciences, applicants should demonstrate aptitude for and commitment to scientific research, usually through productive research experience as undergraduates. Applications are accepted from students who request admission to the first year of the program. Consideration also is given to applications for admission to advanced standing from individuals currently enrolled in the College of Medicine or Graduate College at The University of Iowa.

Application Procedures

The University of Iowa College of Medicine participates in the American Medical College Application Service (AMCAS). Program applicants should instruct AMCAS to forward their credentials to the College of Medicine (IA131) as soon as possible after June 15. At the same time, applicants should request a separate Medical Scientist Training Program application from the program office, 5-572 Bowen Science Building, The University of Iowa, Iowa City, Iowa 52242. Applications to the Medical Scientist Training Program are reviewed by the program selection committee after AMCAS applications are received.

The deadline for receipt of applications is December 1. Applications should be submitted as early as possible to facilitate review by both the College of Medicine admissions committee and the program selection committee. Equal consideration is given to all applicants regardless of their state of residence.

Courses

50:211 MSTP Summer Research **arr.**
Summer research experience for students in the Medical Scientist Training Program.

50:212 MSTP Clinical Conference **1 s.h.**
Introduction to clinical research, with patient presentations and discussion of clinically oriented research topics; for students in the graduate studies component of the Medical Scientist Training Program.

MEDICAL TECHNOLOGY

See "Division of Associated Medical Sciences."

MICROBIOLOGY

Acting head: Allen J. Markovetz
Professors: Robert F. Ashman (Internal Medicine), John E. Butler, John Cazin, Jr., Charles D. Cox, Irving P. Crawford, Michael G. Feiss, Rudolph P. Galask (Obstetrics and Gynecology), David T. Gibson (Professor of Biocatalysis), E. Peter Greenberg, Charles Grose (Pediatrics), Louis G. Hoffmann, William Johnson, John D. Kemp (Pathology), David M. Lubaroff (Urology), Richard G. Lynch (Pathology), Allen J. Markovetz, Erich W. Six, Donald P. Stahly, George V. Stauffer, Mark F. Stinski, C. Martin Stoltzfus
Associate professors: Steven Clegg, Morris O. Dailey (Pathology), Lacy Daniels, Stanley Perlman (Pediatrics), Jose E. Rodriguez, Donald H. Walker
Assistant professors: Gail A. Bishop (Internal Medicine), Caroline S. Harwood
Undergraduate degree offered: B.S. in Microbiology
Graduate degrees offered: M.S., Ph.D. in Microbiology

Undergraduate Program

See "Microbiology" in the College of Liberal Arts section of the *Catalog*.

Graduate Programs

The objectives of the graduate programs in microbiology are to help students become highly qualified in research and in teaching of microbiology.

Seven areas are included in the program: biotechnology, pathogenic bacteriology, microbial genetics, immunology, microbial physiology, medical mycology, and animal virology. Several of these specialized areas involve interdisciplinary training within and outside the department, so students receive broad experience during their course of study.

Students working for the Ph.D. degree may obtain an M.S. degree during their graduate work or proceed directly toward the Ph.D.

All students admitted as candidates for advanced degrees are expected to assist in departmental teaching.

Incoming students choose a research supervisor who serves as chair of their advisory committee. This committee assists students in planning a program of study and, from time to time, reviews students' progress in research.

The department cooperates with other departments in the various colleges on campus, affording ample opportunity for students to avail themselves of diverse course offerings, seminars, and research programs. For example, courses and seminars in clinical laboratory microbiology, immunology, genetics, cellular and molecular biology, and electron microscopy are taught on an interdepartmental basis.

Master of Science

Candidates for the M.S. degree are required to take a minimum of 12 semester hours of microbiology courses in three of the seven different subdisciplines available in microbiology. Students may substitute a course taken previously (at The University of Iowa or elsewhere) for the course requirements, upon obtaining approval from the M.S. committee. Additional course requirements or selections depend on students' interests and the advice of the examining committee. Students must write a thesis based on their own research and defend it satisfactorily in an oral examination.

Doctor of Philosophy

The minimum course requirements for the Ph.D. are one course in each of four subdisciplines (of the seven subdisciplines available in microbiology) or 15 semester hours of course work in two different areas. Students may substitute a course taken previously (at The University of Iowa or elsewhere) for the course requirements, upon obtaining approval from the Ph.D. committee. Students also must pass a comprehensive examination and write a thesis based on their own research. The thesis must be defended satisfactorily in an oral examination.

Facilities

The department shares the Bowen Science Building with the Departments of Anatomy, Biochemistry, Pharmacology, and Physiology and Biophysics. Laboratory space and modern equipment are available for teaching and research.

Admission

Prospective graduate students should become familiar with the general admission requirements of the Graduate College. Departmental requirements include a review and formal vote by the faculty before students are admitted. Before beginning graduate work, students must have completed courses in biology, chemistry (inorganic and organic), mathematics including calculus, and physics. Students admitted without the above course work must take it during the first year of graduate school. Students should have a grade-point average of 2.70 or better to be admitted to the graduate program in microbiology.

Courses

Microbiology majors may not use 61:218 to fulfill the semester hour requirement for their degrees.

61:000 Cooperative Education Internship **0 s.h.**

61:103 Medical Microbiology **arr.**
Principles and methods essential to study of microorganisms, their isolation, and identification; microorganisms involved in infectious diseases; current concepts of immunology. Open only to College of Medicine students or to others with consent of course director.

61:112 Health Sciences Microbiology **4 s.h.**
Introductory course in medical microbiology covering bacteriology, immunology, pathogenic bacteriology, virology, mycology, and parasitology. Open only to dental, physician assistant, and pharmacy students.

61:147 Survey of Immunology **4 s.h.**
Interdisciplinary survey of fundamentals of cellular and molecular immunology and their application to clinical problems; appreciation of the field as a whole; involves faculty from the Departments of Microbiology, Internal Medicine, Pathology, Urology, and others. Consent of instructor required for undergraduates. Prerequisite: 61:157 with a grade of C or higher or an introductory course in biochemistry. Same as 78:251.

61:157 General Microbiology **5 s.h.**
Introduction to the principles of microbial diversity, microbial genetics, physiology and metabolism, pathogenic microbiology, virology, immunology, and industrial and environmental microbiology; laboratory exercises covering these areas range from basic techniques to more advanced skills and applications. Prerequisite: 37:3. Corequisite: 4:121.

61:159 Pathogenic Bacteriology **5 s.h.**
Discussion of pathogenic bacteria, with emphasis on mechanisms of pathogenicity and laboratory methods used for isolation and identification of bacteria; laboratory includes advanced methods used in study of pathogenic bacteria. Consent of instructor required. Prerequisite: 61:157 with a grade of C or higher.

61:160 Microbial Physiology **3 s.h.**
Microbial cell structure and function, growth, energy metabolism, biosynthesis, and control mechanisms; 61:180 is an optional laboratory supplement. Prerequisites: 61:157 with a grade of C or higher and a biochemistry course.

61:161 Problems in Microbiology **arr.**
Students work on a research problem under supervision of a microbiology faculty member. Open only to undergraduate majors. Consent of instructor required. Prerequisite: 61:157 with a grade of C or higher.

61:163 Seminar: Microbiology **1 s.h.**
Current topics in microbiology and immunology. Prerequisite: 61:157 with a grade of C or higher.

61:164 Microbiology **4 s.h.**
Introduction; emphasis on medical microbiology, principles of immunology. Open only to pre-nursing and pre-dental hygiene students. Prerequisite: 37:1.

61:165 Clinical Laboratory Microbiology **arr.**
Fundamental and practical training in isolating and identifying bacteria and fungi from clinical materials; offered cooperatively with the University Hygienic Laboratory. Consent of instructor required. Prerequisite: 61:159.

61:166 Clinical Laboratory Virology **arr.**
Fundamental and practical training in viral isolation and the laboratory diagnosis of viral infections; offered cooperatively with the University Hygienic Laboratory. Consent of instructor required. Prerequisite: 61:157 with a grade of C or higher.

61:167 Molecular Immunology Lecture **3 s.h.**
Basic principles governing the immune system at the molecular level; theoretical basis of methods used for the purification and characterizations of proteins of immunological importance; principles governing antigen-antibody interactions; chemistry, molecular genetics, and molecular interactions of immunologically important molecules, including antibodies, MHC antigens, CD antigens, Fc receptors, complement, and interleukins. Prerequisites: 61:147, 99:120, and consent of instructor.

61:168 Introduction to Animal Viruses **4 s.h.**
Lecture and laboratory course designed for undergraduate students majoring in a biological science; basic physical, chemical, and biological properties of animal viruses and their association with human disease; laboratory covers methods used in basic and clinical laboratory virology. Consent of instructor required. Prerequisite: 61:157 with a grade of C or higher.

61:169 Medical Mycology **4 s.h.**
Basic topical material and laboratory techniques used in study of fungi pathogenic for human beings and lower animals. Prerequisite: 61:157 with a grade of C or higher. Same as 2:137.

61:170 Microbial Genetics **3 s.h.**
Genetics of bacteria and bacteriophages; 61:175 is optional laboratory supplement. Prerequisite: 61:157 with a grade of C or higher or consent of instructor.

61:171 Honors Microbiology **arr.**
Introduction to experimental research. Open only to juniors and seniors with a 3.20 grade-point average overall and 3.20 in microbiology.

61:172 Honors Microbiology **arr.**
Prerequisite: 61:171.

61:173 Laboratory Methods in Cellular Immunology **3, 5 s.h.**
Fundamental theories of cellular immunology and methods used for investigating these theories; emphasis on role of lymphocytes in both humoral and cell-mediated immunity; intermediate-level; for graduate students, clinical trainees, and fourth-year medical students. Consent of instructor required. Prerequisite: 61:103 or 61:147.

61:175 Microbial Genetics Laboratory **2 s.h.**
Experiments illustrating basic principles of genetic analysis in bacteria and bacteriophage. Consent of instructor required. Corequisite: 61:170.

61:177 Molecular Immunology Laboratory **1-3 s.h.**
Hands-on experience with commonly used methods in molecular immunology and data interpretation, presented in three four-week sessions: immunoglobulin purification, characterization, and production of specific antibodies; solid-phase and liquid-phase antigen-antibody reactions; recombinant DNA methodology in molecular immunology; sessions may be taken independently. Consent of instructor required. Prerequisites: 61:147 and 99:120. Corequisite: 61:167.

61:178 Advanced Genetics **2 s.h.**

61:179 Bacterial Diversity **3 s.h.**
Isolation and cultivation of a wide variety of bacteria from a variety of habitats; physiological and genetic characteristics of selected groups of bacteria. Consent of instructor required. Prerequisite: 61:157 with a grade of C or higher.

61:180 Microbial Physiology Laboratory **2 s.h.**
Techniques used for isolation and growth of microorganisms, chemical analysis of cells, study of nutrient transport, elucidation of metabolic pathways, and study of enzymes. Consent of instructor required. Corequisite: 61:160.

61:207 Advanced Topics in Immunology **3 s.h.**
Critical assessment of the primary immunologic literature and skill in scientific presentation; two major topics each semester. Consent of instructor required. Prerequisites: 61:147 or equivalent.

61:215 Genetics Seminar 0-2 s.h.
Same as 37:215, 2:215, 99:215.

61:217 Immunology Research Seminar 1 s.h.
Current research at The University of Iowa.

61:218 Electron Microscopy Techniques 3 s.h.
Theory and operation of electron microscope; tissue processing, fixation, staining and ultramicrotomy; negative staining; associated photographic techniques; student project required; lecture, laboratory. Open only to graduate students. Consent of instructor required. Prerequisite: course in cell biology. Same as 2:218, 37:218.

61:220 Advanced Electron Microscopy arr.
Open only to graduate students using electron microscopy in their research. Same as 2:220.

61:260 Topics in Microbial Physiology arr.
Discussion of current ideas and concepts in microbial physiology and metabolism. Consent of instructor required.

61:261 Research: Microbiology arr.
Open only to candidates for advanced degrees in microbiology. Consent of instructor required.

61:268 Molecular Biology of Animal Viruses 3 s.h.
Molecular biology of animal DNA and RNA viruses and the interaction of these viruses with the eucaryotic cell; mechanisms of viral latency, persistence, cellular transformation, and oncogenesis; for advanced undergraduate and graduate students majoring in a biological science. Prerequisites: 61:170 or a course in biochemistry or equivalent.

61:270 Topics in Molecular Biology arr.
Lectures and seminars; topics vary. May be repeated. Consent of instructor required.

61:272 Seminar in Cellular and Molecular Biology 1 s.h.
Same as 37:272, 60:272, 71:272, 72:272, 99:272.

MOLECULAR BIOLOGY

Chair: Richard A. Maurer
Professors: Arthur Arnone (Biochemistry), Thomas Conway (Biochemistry), John E. Donelson (Biochemistry), Michael Feiss (Microbiology), Alan G. Goodridge (Biochemistry), Gary Gussin (Biology), Richard A. Maurer (Physiology and Biophysics), John R. Menninger (Biology), Roger D. Milkman (Biology), Bryce V. Plapp (Biochemistry), Peter A. Rubenstein (Biochemistry), Erich W. Six (Microbiology), David R. Soll (Biology), Michael Solursh (Biology), Mark F. Stinski (Microbiology), C. Martin Stoltzfus (Microbiology), Joseph A. Walder (Biochemistry)
Associate professors: Steven Clegg (Microbiology), Gordon D. Ginder (Internal Medicine), Robert W. Karr (Internal Medicine), Jim Jung-Ching Lin (Biology), Robert E. Malone (Biology), Stanley Perlman (Pediatrics), Jeffrey E. Pessin (Physiology and Biophysics), George V. Stauffer (Microbiology), Lubomir P. Turek (Pathology)
Assistant professors: Richard A. Anderson (Internal Medicine), Mary B. Boyle (Physiology and Biophysics), Robert J. Deschenes (Biochemistry), Jan Fassler (Biology), Pamela Geyer (Biochemistry), E. Peter Greenberg (Microbiology), Wayne A. Johnson (Physiology and Biophysics), Charles Lutz (Pathology), W. Scott Moye-Rowley (Physiology and Biophysics), David H. Price (Biochemistry), Andrew F. Russo (Physiology and Biophysics), Mark S. Wold (Biochemistry)
Graduate degree offered: Ph.D. in Molecular Biology

Graduate Program

The Molecular Biology Ph.D. Program provides interdisciplinary training in the concepts and methodologies fundamental to the investigation of biological mechanisms at the molecular level. More than 30 faculty members are involved in a variety of research projects related to gene expression and regulation. The principal didactic component of the program is a sequence of core courses in prokaryotic and eukaryotic molecular biology. Students engage in laboratory research immediately upon enrollment and progress rapidly to original thesis projects that lead to the Ph.D. degree in molecular biology.

Requirements

The graduate program is sufficiently flexible to accommodate students with a wide range of backgrounds in the biological and physical sciences. Entering students are expected to have a solid background in science, including introductory biology and chemistry, organic chemistry, physical chemistry, calculus, genetics, and biochemistry. Students can remedy deficiencies in particular areas by taking appropriate courses during the first year of graduate study.

Curriculum

The curriculum consists of a sequence of required and elective courses that provide didactic training in molecular biology and ensure a comprehensive exposure to the concepts and experimental methodologies of this field. Because of the diversity of biological research problems that can be pursued by employing molecular biological approaches, the program provides a variety of options for specialization in particular areas of interest.

Four courses are required of all students:

99:241 Biophysical Chemistry I	3 s.h.
142:210 Molecular Biology I	3 s.h.
142:215 Molecular Biology II	3 s.h.
61:268 Molecular Biology of Animal Viruses and the Eucaryotic Cell	3 s.h.
142:290 Seminar in Molecular Biology (required of all students throughout the first and second years)	1 s.h.

In addition to these core courses, students are required to complete at least 8 semester hours in four or more approved elective courses.

After successful completion of the comprehensive examination, usually at the end of the second year of graduate study, students advance to candidacy for the Ph.D. degree, where they devote full-time effort to completing thesis research and writing the Ph.D. dissertation. Upon successful completion of all requirements, including the dissertation and its oral defense in accordance with rules and regulations of the Graduate College, students are awarded the Ph.D. degree in molecular biology.

Financial Aid

Graduate students in the Molecular Biology Ph.D. Program receive stipends and tuition support from institutional and extramural sources, including training grants from the National Institutes of Health as well as University of Iowa fellowships and graduate research assistantships.

Facilities

Training is conducted primarily in laboratories and teaching facilities of the Departments of Biochemistry, Biology, Microbiology, and Physiology and Biophysics—which offer graduate degrees, and the Departments of Internal Medicine, Pathology, and Pediatrics, whose focus is clinical. Faculty laboratories and central research facilities available to students provide access to the most up-to-date research equipment, including an oligonucleotide synthesizer and an automated DNA sequence analysis apparatus.

Admission

Individuals seeking application materials and information about predoctoral and postdoctoral training in molecular biology should contact Molecular Biology Ph.D. Program, 5-572 Bowen Science Building, The University of Iowa, Iowa City, Iowa 52242.

Courses

142:210 Molecular Biology I 3 s.h.
Mechanism and regulation of RNA, DNA, and protein biosynthesis in prokaryotes; emphasis on experimental methods for biochemical, genetic, and recombinant DNA analysis of these processes. Prerequisite: 99:130 or equivalent.

142:215 Molecular Biology II 3 s.h.
Mechanism and regulation of RNA, DNA, and protein biosynthesis in eukaryotes; emphasis on differences from prokaryotic organisms and experimental methods for analysis of these processes. Prerequisite: 142:210.

142:220 Cell Biology I 3 s.h.
Integration of concepts of cell biology and original research data concerning the structure, chemistry, and function of cellular organelles and their assembly; emphasis on relation of cellular structure and function from macromolecular to organelle-cellular levels of organization; plasma membrane, endoplasmic reticulum, cytoskeleton, centriole and centrosome; Golgi apparatus, lysosome, mitochondria, nucleus. Prerequisite: introductory biology course, and 99:130 or equivalent.

142:225 Cell Biology II 3 s.h.
Concepts and developments in the physiology and regulation of eukaryotic cell processes; emphasis on biochemical and biophysical aspects of cellular functions, including membrane processes; cell-cell recognition, adhesion, and communication; cell-matrix interactions; intercellular signaling mechanisms; regulation of cell division. Prerequisite: 142:220.

142:290 Seminar in Molecular Biology 1 s.h.
Research findings in molecular biology. May be repeated. Open only to students in the Molecular Biology Ph.D. Program or to others with consent of instructor.

142:301 Directed Study in Molecular Biology arr.
Selected topics examined in-depth under faculty direction. Consent of instructor required.

142:305 Molecular Biology Research arr.
Open only to molecular biology graduate students. Consent of instructor required.

142:405 Thesis arr.
Open only to advanced degree candidates in molecular biology.

NEUROLOGY

Head: Antonio R. Damasio
Professors: Harold P. Adams, Jr., Adel Afifi (Pediatrics/Anatomy), James Bale (Pediatrics), William E. Bell (Pediatrics), José Biller, E. Peter Bosch, James J. Corbett, Antonio R. Damasio, Hanna Damasio, Richard Fincham, Jun Kimura, Ramon Lim, Robert Rodnitzky, William Talman, Gary Van Hoesen (Anatomy), Thoru Yamada
Professors emeriti: Arthur L. Benton (Psychology), John Knott
Associate professors: Matthew Rizzo, Daniel Tranel
Associates: Patricia Johnston, Laurence Krain, Angel Leis, Mark Ross
Assistant research scientist: Robert D. Jones
Postdoctoral associates: Steven Anderson, Hisashi Ohta
Senior speech pathologist: Linda Jordan

Neurology is the branch of medical science concerned with diagnosis and management of disorders of the brain, spinal cord, peripheral nervous system, and muscle. Teaching and postgraduate training, carefully integrated with patient care, have long been a significant function of the department.

The department offers clinical and clinical research training to third- and fourth-year medical students, contributing to the Doctor of Medicine degree. An active, three-year approved residency program qualifying physician trainees for board certification in neurology is a major aspect of departmental activity; experience in clinical electrophysiology, pediatric neurology, psychiatry, and neuropathology is part of this training. The department also offers research opportunity in behavioral neurology to candidates for the Doctor of Philosophy degree in psychology.

Investigative interests of the faculty center on behavioral neurology, electrophysiological correlates of central and peripheral nervous system disease, growth factors in the nervous system, control and regulation of autonomic functions, peripheral neuropathy, cerebrovascular disease, neuro-ophthalmology, and movement disorders.

Courses

64:11 Clinical Neurology **2 s.h.**
Ward teaching and bedside examinations in small groups.

64:100 Neurology Elective for Physician Assistant Students **arr.**

64:112 Principles of Neurology and Clinical Sciences **1 s.h.**
Lectures, demonstrations, and case presentations of neurologic disorders; anatomy of nervous system reviewed and methods of electrophysiological testing of nerve injuries demonstrated. Same as 101:176.

64:207 Introduction to Behavioral Neurology **2 s.h.**

64:238 Introductory Neuropsychological Assessment **arr.**
Standard behavioral assessment procedures; administration of neuropsychological tests under supervision of staff members and preparation of integrated reports on collected data; involvement in an ongoing or new research project; students must demonstrate high level of proficiency in administration and interpretation of neuropsychological tests, as well as competent research skills.

64:239 Advanced Neuropsychological Assessment **arr.**
Continuation of 64:238.

64:302 Advanced Inpatient Neurology **4 s.h.**

64:303 Advanced Outpatient Neurology **4 s.h.**

64:305 Behavioral Neurology and Language Disorders **arr.**
Supervised study of types of behavioral impairment and aphasic disorders shown by patients with nervous disease; their significance for identifying presence, extent, and locus of cerebral lesions. Two-month course; offered all year.

64:306 Neurological Subinternship **8 s.h.**

64:310 Cerebrovascular Disease **arr.**
Experience in evaluation and management of patients with cerebrovascular diseases; conferences, clinical rounds.

64:998 Special Studies on Campus **arr.**

64:999 Special Studies off Campus **arr.**

NEUROSCIENCE

Chair: Joe D. Coulter
Professors: Paul J. Abbas (Speech Pathology and Audiology), Nancy C. Andreasen (Psychiatry), Ranbir K. Bhatnagar (Pharmacology), Michael J. Brody (Pharmacology), Kevin P. Campbell (Physiology and Biophysics), P. Michael Conn (Pharmacology), Joe D. Coulter (Anatomy), Antonio Damasio (Neurology), Hanna Damasio (Neurology), Gary R. Dutton (Pharmacology), Robert E. Fellows (Physiology and Biophysics), Bruce J. Gantz (Otolaryngology), Gerald F. Gebhart (Pharmacology), Carl V. Gisolfi (Exercise Science/Physiology and Biophysics), Isidore Gormezano (Psychology), Michael N. Hart (Pathology), Donald D. Heistad (Internal Medicine), James V. Hinrichs (Psychology), Richard R. Hurtig (Speech Pathology and Audiology), Alan Kim Johnson (Psychology), Ramon Lim (Neurology), John P. Long (Pharmacology), Erich S. Luschei (Speech Pathology and Audiology), William J. Rhead (Pediatrics), Philip G. Schmid (Internal Medicine), Eugene Spaziani (Biology), Barbara A. Stay (Biology), Gary W. Van Hoesen (Anatomy), Edward A. Wasserman (Psychology), James R. West (Anatomy), Terence H. Williams (Anatomy), George Winokur (Psychiatry), Chun-Fang Wu (Biology)
Associate professors: Martin D. Cassell (Anatomy), Jeffrey L. Denburg (Biology), Robert B. Felder (Internal Medicine), Jean Y. Jew (Anatomy), Carl Kukulka (Physical Therapy), Heli-Kristy Kultas-Ilinsky (Anatomy), Nicholas J. Pantazis (Anatomy), Stanley Perlman (Pediatrics), Alan Randich (Psychology), Robert L. Schelper (Pathology), William Talman (Neurology) Rafiq Waziri (Psychiatry)
Assistant professors: Mary B. Boyle (Physiology and Biophysics), Kelly J. Cole (Exercise Science), Steven H. Green (Biology), Rodrigo O. Kuljis (Neurology), Steven A. Moore (Pathology), Sean P. Murphy (Pharmacology), Matthew Rizzo (Neurology), Andrew F. Russo (Physiology and Biophysics), Erwin F. Shibata (Physiology and Biophysics), Daniel T. Tranel (Neurology)
Graduate degree offered: Ph.D. in Neuroscience

Graduate Program

The neuroscience program provides an interdisciplinary and interdepartmental approach to graduate education and research training in the structure, function, and development of the nervous system and its role in behavior.

Because of its interdisciplinary nature and the diverse backgrounds of entering students, the program provides considerable flexibility in curriculum structure. The plan of study for each student is developed to provide appropriate background courses as well as a selection of elective courses appropriate to individual training objectives.

The curriculum of the neuroscience program is based on two primary considerations. The first is to provide a sequence of required courses that ensure graduate students a broad and comprehensive exposure to the conceptual and experimental foundations of modern neuroscience. The second is to provide a flexible program of elective courses and advanced training that, while taking into account the multidisciplinary nature of neuroscience, permits in-depth study within any of its five subdivisions: molecular neuroscience, cellular neuroscience, developmental neuroscience, neural systems, and behavioral neuroscience.

Requirements

Background Courses

Students are expected to complete at least 3 semester hours in each of four fields: biochemistry, general physiology, cell biology, and statistics. As necessary, these requirements may be fulfilled by an approved combination of existing courses at The University of Iowa. These background course requirements should be fulfilled by the end of the first year of graduate study. Waivers of background course requirements may be requested by students who have taken equivalent courses prior to entering the neuroscience program.

Neuroscience Courses

Five required courses form the core of the neuroscience graduate curriculum: 132:180, 132:234, 132:244, 132:245, and 132:265. In addition, students register for research credit (132:305) each semester.

Elective Courses

All students in the neuroscience program are required to take three or more advanced elective courses, for a total of at least 6 semester hours. These are selected from an approved list of courses offered by the Departments of Anatomy, Biology, Pharmacology, Physiology and Biophysics, Psychology, and other departments of the Graduate College and College of Medicine. Elective courses are to be taken from at least two of the five subdivisions of the neuroscience program. Students should select courses from the subdivision representing their area of specialization and at least one course from a related subdivision.

Financial Aid

Graduate students in the Neuroscience Ph.D. Program are eligible for stipends and tuition support, including training grants from the National Institutes of Health and the National Institute of Mental Health, and University fellowships and graduate research assistantships.

Facilities

Training is conducted primarily in the laboratories and teaching facilities of the graduate Departments of Anatomy, Biology, Biochemistry, Pharmacology, Physiology and Biophysics, Psychology, and Speech Pathology and Audiology, and the clinical Departments of Neurology and Psychiatry. Students use faculty laboratories and central research facilities for ultrastructural analysis; histochemistry and immunocytochemistry; electrophysiology; fluorescence-activated cell sorting; cellular and subcellular biochemistry; cell, tissue, and organ culture; operant and classical conditioning; molecular biology; and behavioral genetics.

Admission

Information about predoctoral and postdoctoral training opportunities in the neurosciences is available from the Neuroscience Program Office, 5-572 Bowen Science Building, The University of Iowa, Iowa City, IA 52242.

Courses

132:180 Introduction to the Neurosciences 3 s.h.
Functioning of nervous systems at the molecular and cellular levels, as well as such expressions of brain activity as perception; experimental approaches of different disciplines and their contributions to this field, including neurophysiology, molecular neurobiology, neuroanatomy, developmental neurobiology. Offered spring semesters. Prerequisite: 37:3. Same as 37:180.

132:181 Neurophysiology 3 s.h.
Analyses of physiological properties of nerve cells and nervous systems; axonal conduction, synaptic transmission, sensory transduction, integrative processes, and higher functions. Offered spring semesters. Prerequisites: 37:180, 22M:25 or equivalent, and 29:12; or consent of instructor. Same as 37:181.

132:234 Medical Neuroscience 4 s.h.
Basic principles of neurophysiology and neuroanatomy, with emphasis on the human central nervous system; lecture, laboratory; the laboratory primarily involves anatomical study of spinal cord and brain. Offered spring semesters; offered concurrently with 50:234. Consent of course director required. Same as 50:234, 60:234, 72:234.

132:244 Behavioral Neuroscience 2 s.h.
Basic principles of behavioral neuroscience, including motivation, conditioning, physiology of consummatory behaviors. Offered fall semesters. Consent of course director required. Same as 31:244, 71:244.

132:245 Developmental Neuroscience 2 s.h.
Basic principles of developmental neurobiology, including neurogenesis, neuronal differentiation and proliferation, and synaptogenesis. Offered fall semesters. Same as 37:245, 60:245.

132:250 Topics in Neuroscience 1 s.h.
Introduction to the research interests of neuroscience faculty and opportunities for research training in the neurosciences. Consent of instructor required. Same as 60:250.

132:265 Neuroscience Seminar 0-1 s.h.
Research presentations by students, faculty, and visiting scholars. Offered fall and spring semesters. Consent of instructor required. Same as 31:265, 37:265, 60:265, 72:265.

132:301 Directed Study in Neuroscience arr.
Advanced investigation of a narrowly defined subject area, supervised by program faculty.

132:305 Neuroscience Research arr.
Open to graduate students in the Neuroscience Ph.D. Program. Consent of instructor required.

132:405 Thesis arr.

NUCLEAR MEDICINE TECHNOLOGY

See "Division of Associated Medical Sciences."

OBSTETRICS AND GYNECOLOGY

Head: J.R. Niebyl
Professors: F.K. Chapler, R.P. Galask (Microbiology), C.P. Goplerud, D.W. Laube, J.R. Niebyl, D.E. Van Orden, F.J. Zlatnik
Clinical professors: W. Dow Edgerton, R.M. Kretzschmar, D.W. Wetrich
Associate professors: B. Anderson, J.A. Benda (Pathology), D.H. Chestnut (Anesthesia), C.A. deProsse, L.R. Hughes, S.R. Johnson, C.P. Weiner, R.A. Williamson
Assistant professors: C.H. Syrop, D.A. Turner

Programs

Course Work for M.D. Students

Courses in obstetrics and gynecology are designed to give M.D. students a comprehensive survey of reproductive medicine. This is done through a series of didactic lectures, inpatient and outpatient assignments, ward rounds, teaching seminars, and special elective courses.

The third-year clerkship (66:4 Clinical Obstetrics and Gynecology) gives students the core knowledge, skills, and attitudes needed to provide primary health care to women patients.

The department offers fourth-year students a variety of electives that provide advanced training in the special areas of obstetrics and gynecology. In addition to clerkships at The University of Iowa Hospitals and Clinics, these electives include rotations at Broadlawns Medical Center, Des Moines, and at the Gundersen Clinic, La Crosse, Wisconsin.

Residency Program

The department offers a four-year residency. Upon completion, graduates are eligible for the written and oral examinations leading to certification by the American Board of Obstetrics and Gynecology.

Residents are assigned to the various divisions and clinical services of the department and care for both hospital inpatients and outpatients. Additional training is obtained in prenatal clinics in Waterloo, Des Moines, Muscatine, Clinton, and Davenport. During the final two years, residents spend time at Iowa Methodist Hospital and Broadlawns Medical Center in Des Moines, and at St. Luke's Hospital in Davenport. They are trained in normal and abnormal obstetrics, gynecologic surgery, office gynecology, reproductive endocrinology, gynecologic oncology, family planning, and endoscopic procedures.

Courses

66:4 Clinical Obstetrics and Gynecology arr.
Clerkship; proficiency in special history taking and physical examination of obstetric and/or gynecologic patients and in applying concepts of diagnostic techniques and therapy; special attention to outpatient gynecology, family planning, and techniques for early detection of gynecologic cancer.

66:6 Advanced Obstetric Clerkship: Iowa City arr.
Evaluation of new patients in high-risk obstetric clinic; continuing antepartum care; work-up majority of complicated patients admitted to the obstetric ward and, under supervision, order diagnostic studies and follow their course; assist in various diagnostic and therapeutic procedures such as fetal heart rate testing, amniocentesis, ultrasonography, and intrauterine fetal transfusion.

66:9 Advanced Gynecologic Clerkship arr.

66:10 Gynecologic Oncology arr.

66:13 Reproductive Endocrinology: Infertility arr.

66:16 Advanced Obstetric-Gynecologic Clerkship: La Crosse, Wisconsin arr.

66:17 Advanced Obstetric Clinical Clerkship: Broadlawns Medical Center, Des Moines arr.

66:100 Obstetrics and Gynecology for Physician Assistant Students arr.

66:110 Obstetrics and Gynecology Elective for Physician Assistant Students arr.

66:997 Research arr.

66:998 Special Studies on Campus arr.

66:999 Special Studies off Campus arr.

OPHTHALMOLOGY

Head: Thomas A. Weingeist
Professor emeritus: Frederick C. Blodi
Professors: James J. Corbett, Robert Folberg, James C. Folk, Sohan S. Hayreh, G. Frank Judisch, Hansjoerg E. Kolder, Jay H. Krachmer, Karl C. Ossoinig, William E. Scott, H. Stanley Thompson, Thomas A. Weingeist
Associate professors: Ronald V. Keech, Jeffrey A. Nerad
Assistant professors: Wallace L.M. Alward, Christopher F. Blodi, Thomas A. Farrell, Randy H. Kardon, Alan E. Kimurn, Jose S. Pulido

Ophthalmology is a medical and surgical specialty concerned with research, diagnosis, and treatment of diseases of the eye and its adnexa, including correction of refractive errors. Several subspecialties are represented in the department: ocular pathology and physiology, pediatric ophthalmology, retinal disorders, glaucoma, neuro-ophthalmology, echography, cornea and external diseases, vascular diseases,

plastic surgery, contact lens and refraction service, and medical ophthalmic photography.

The department prepares students for careers in teaching and research. Its teaching program trains medical students and resident physicians, with emphasis on a scientific approach to problem solving in diagnosis and treatment.

The residency program lasts three years, culminating in qualification for the examination of the American Board of Ophthalmology.

Facilities

The department maintains several research laboratories: tumor diagnosis, pathology, electrophysiology, pupillography, and vascular disease. Clinical facilities are available not only at The University of Iowa Hospitals and Clinics but also at the Veterans Affairs Medical Centers in Iowa City and in Des Moines. The department also manages an eye clinic at the Broadlawns Medical Center in Des Moines. The department sponsors a biennial international symposium, an annual national conference, and a monthly statewide program of continuing education.

Courses

67:100 Elective in Ocular Pathology 4 s.h.
Grossing ocular specimens, reading histologic slides, studying reference assignments, examining teaching collection of slides, and self-assessment examination. Four-week course.

67:101 Elective in External Eye Disease 4 s.h.
Common diseases of the eyelid, conjuctiva, and cornea. Four-week course.

67:102 Elective in Neuro-Ophthalmology arr.
Visual and ocular motor dysfunction due to neurologic disease; students work-up patients, do assigned reading, and make neuro-ophthalmology rounds every afternoon. Four-week course.

67:103 Elective in Pediatric Ophthalmology arr.
Clinical work-up of squint patients, daily strabismus rounds, reading assignments, self-assessment program. Two-week course.

67:105 Introduction to Clinical Ophthalmology arr.
Ocular history, visual acuity, intraocular pressure, extraocular muscles, pupillary responses, slit lamp examination, and fundus examination; introductory material on common ocular diseases. Two-week course for students who do not intend to become ophthalmologists.

67:106 Ocular Genetics: Pediatric Ophthalmology 4 s.h.

67:108 Ophthalmology Elective for Physician Assistant Students arr.
Ophthalmologic emergencies, urgent eye disorders, common conditions usually brought to the family physician; understanding of appropriate management of ophthalmic conditions under physician supervision; students develop psychomotor skills and attitudes necessary to manage patients.

67:109 Molecular Ophthalmology arr.
Use of recombinant DNA, tissue culture, and protein electrophoresis in the study of inherited eye diseases; directed reading, library research, clinical and laboratory activities. Four-week course. Consent of instructor required.

67:999 Special Studies off Campus arr.

ORTHOPAEDIC SURGERY

Head: Reginald R. Cooper
Professors: John P. Albright, William Blair, Richard A. Brand, Thomas Brown, Joseph A. Buckwalter, Charles R. Clark, Reginald R. Cooper, Georges Y. El-Khoury, Jerry A. Maynard, Stuart L. Weinstein
Professors emeriti: Michael Bonfiglio, Ignacio V. Ponseti
Associate professors: Frederick Dietz, James Nepola, Curtis Steyers, James Weinstein
Assistant professors: Ernest Found, J. Lawrence Marsh, David Tearse
Clinical professors: Richard C. Johnston, James Puhl

The department offers two types of postgraduate training. The first is a five-year integrated clinical program in which interns and residents participate simultaneously in inpatient and outpatient care, surgery, and sciences related to the neuromusculoskeletal system. The second is a six-year program for those interested in full-time academic orthopaedic careers.

Programs

Clinical Program

Trainees enter this program directly from medical school through the National Internship Matching Plan. The program consists of a one-year categorical diversified orthopaedic internship and four years in orthopaedic residency.

During the internship year, trainees gain experience not only in clinical orthopaedics but also in medicine, pediatrics, neurology, surgical specialties, intensive care, anesthesiology, and other services.

During the following years, residents gain experience in trauma, children's orthopaedics, adult orthopaedics, neuromuscular disorders, rehabilitation, prosthetics and orthotics, rheumatology, and basic science as related to orthopaedics. They take specialized courses in anatomy, bone histology, biochemistry, physiology, and pathology.

A weekly seminar covers biomechanics, kinesiology, and selected clinical subjects.

Academic Orthopaedics Program

This program includes the training described above under the clinical program and an additional one or two years of research. This research may be in any field in which the resident is interested, provided it is related to the musculoskeletal system. It may be done in one of the orthopaedic laboratories or in a basic science department.

Laboratories

The orthopaedics laboratories deal with problems in these major subject areas:

Biochemistry—The biochemistry of mucopolysaccharides and collagen, both normal and those altered in epiphyseal dysplasias and scoliosis.

Biomechanics—In conjunction with the College of Engineering, problems of the upper extremity; biomechanics of the spine, hip, and gait; total joint replacements.

Cell biology and pathology—Ultrastructural studies on normal bones, cartilage, tendons, and muscles, and on those altered by experiment and disease.

Tissue transplant, radioactive isotopes, and metabolic bone disease—skin, bone, and cartilage transplantation, skeletal physiology; qualitative and quantitative aspects of histology, mineral composition, and bone density, effect of in vivo and in vitro metabolic bone disease, and exercise.

Facilities

The department is housed in the Roy J. Carver Pavilion of The University of Iowa Hospitals and Clinics and has an active service in the Veterans Affairs Medical Center.

Facilities include 75 beds, an outpatient clinic, an outpatient operating room, a specialty library, a specialty radiology unit, and physical therapy facilities.

Specialty clinics deal with such problems as scoliosis, club feet, congenital dislocated hip, neuromuscular disease, metabolic disease, neck, back, amputation, hip, knee, hand, neoplasm, and trauma.

Physicians in the outpatient clinic see approximately 155 patients per day. Approximately 2,500 major operations are performed each year under auspices of the department.

The department provides consulting service to University Hospital School, Regional Child Health Specialty Clinics, and two state schools for the mentally retarded.

Courses

76:2 Clinical Orthopaedics arr.

76:102 Orthopaedics Elective for Physician Assistant Students arr.

76:105 Rehabilitation Elective for Physician Assistant Students arr.

76:201 Advanced Clinical Orthopaedics arr.
Open only to senior medical students.

76:202 Musculoskeletal Trauma arr.
Open only to senior medical students.

76:203 Surgical Care of the Hand arr.
Open only to senior medical students.

76:998 Special Studies on Campus arr.
Open only to senior medical students.

76:999 Special Studies off Campus arr.
Open only to senior medical students.

OTOLARYNGOLOGY—HEAD AND NECK SURGERY

Head: Brian F. McCabe
Professors: Janusz Bardach, Bruce J. Gantz, Lee A. Harker, William E. LaVelle, Brian F. McCabe, Hughlett L. Morris, William H. Olin, D.C. Spriestersbach, Richard S. Tyler, Duane R. Van Demark
Associate professor emeriti: Jeanne K. Smith, Richard Voots
Assistant professors: John L. Frodel, Steven D. Gray
Research scientists: Kevin M. Kelly, Francis K. Kuk, Clarissa R. Lansing, Nancy S. Tye-Murray
Clinical associate professors: Thomas J. Benda, Carl E. Betts, Guy E. McFarland
Clinical assistant professor: Peter L. Alt

The department provides one of the oldest and largest otolaryngology—head and neck surgery training programs in the world. Currently it has a full-time faculty of 13, including several members from plastic surgery, audiology, speech pathology and audiology, and dentistry (orthodontics and prosthodontics).

The department's main objective is to provide a high-level instructional program in otolaryngology—head and neck surgery for medical students and residents. To maintain a teaching program, the department's faculty and staff carry a large patient load in head and neck oncology, head and neck plastic reconstructive surgery, facial trauma, craniofacial congenital defects (such as cleft lip and palate), neurotology, pediatric and geriatric hearing problems, voice problems, peroral endoscopy, surgery for deafness (including cochlear implant), and all the areas usually considered otolaryngologic.

There are eight divisions in the department that make this program comprehensive: otology and neurotology, plastic and reconstructive surgery of the head and neck, oncologic surgery of the head and neck, rhinology, pediatric otolaryngology, craniofacial defects, speech pathology and audiology, and research.

Another major objective of the department is to foster research programs designed to yield new knowledge in the field and provide models for student and resident research training.

There are several large-scale research programs within the department in vestibular neurophysiology, cleft palate and other craniofacial defects, head and neck oncology, cochlear implants, nasophysiology, facial nerve conduction, microvascular reconstructive surgery, anatomy of the temporal bone, neuroelectric audiometry, bone resorption in ear disease, electrophysiology of the inner ear, and psychoacoustics.

Many of these research programs receive federal and private financial support.

Residency Program

The residency program in otolaryngology is in accord with the requirements of the American Board of Otolaryngology. It consists of a four-year course of basic and clinical science. The basic science lectures and laboratory studies are conducted during the first three and one-half months of residence.

After passing an oral and/or written examination, students enter the clinical phase of the course, which includes supervised clinical and operative work, clinical conferences, and seminars pertinent to the practice of otolaryngology and its related fields.

Courses

68:3 Clinical Otolaryngology 2 s.h.

68:100 Clinical Internship in Otolaryngology arr.

68:101 Head and Neck Oncology arr.

68:104 Basic Principles of Facial Plastic and Reconstructive Surgery 4 s.h.

68:106 Pediatric Otolaryngology arr.

68:199 Basic Otolaryngologic Science arr.
Lectures on descriptive anatomy and physiology, surgical anatomy of head and neck, embryology, microbiology, pathology, pharmacology, anesthesiology, allergy, oral surgery, radiology, speech pathology and audiology, psychology, scientific method; laboratory work in head and neck dissection, histology of ear, and temporal bone surgery.

68:202 Advanced Anatomy for Head and Neck Surgery arr.

68:400 Dental Treatment of Maxillofacial Deformities 2 s.h.
Clinical orthodontics for patients with maxillofacial deformities. Open only to graduate students in dentistry.

68:401 Seminar: Maxillofacial Rehabilitation 1 s.h.
Entire field of facial deformities; seminar. Open only to medical and dental graduate students.

68:402 Fixed Prosthesis in Maxillofacial Rehabilitation arr.
Fixed prosthetic appliances used in maxillofacial rehabilitation; seminar. Open only to graduate students in dentistry.

68:403 Restorative Dentistry in Maxillofacial Rehabilitation arr.
Routine dental care in the maxillofacial patient and how it differs from care in the general population; seminar. Open only to graduate students in dentistry.

68:404 Dental Management in Irradiated Patients arr.
Diagnosis, treatment planning, radiation, and surgical treatment of the patient with head and neck cancer; seminar. Open only to graduate students in dentistry.

68:430 Maxillofacial Prosthesis arr.
Clinical prosthetic treatment for patients requiring intra- or extra-oral prosthesis, including facial and body prostheses. Open only to graduate students in prosthetic dentistry.

68:998 Special Studies on Campus arr.

PATHOLOGY

Head: Richard G. Lynch
Professors: Carol A. Aschenbrener, Carlos W. Bedrossian, Fred R. Dick, Michael N. Hart, Ronald N. Jones, Thomas H. Kent, Franklin P. Koontz, Frank A. Mitros, John D. Olson, George D. Penick, Charles E. Platz, Ronald G. Strauss
Associate professors: Jo Ann Benda, Stephen M. Bonsib, Kent X. Bottles, Robert T. Cook, Ronald D. Feld, Robert Folberg, James A. Goeken, Nancy Goeken, George F. Johnson, Theodore Koerner, Michael A. Pfaller, Robert A. Robinson, Robert L. Schelper, Lubomir P. Turek
Assistant professors: Zsolt Argenyi, Gary L. Baumbach, Morris O. Dailey, Charles T. Lutz, Steven Moore, Donald P. Nicholson, Robert D. Tucker
Lecturers: Ruthanne Hyduke, Marian Schwabbauer
Associates: Larry Birnbaum, James O'Connor
Adjunct associates: John Abadi, Ruth Macke (St. Luke's Hospital, Cedar Rapids, Iowa), Thomas Persoon
Clinical assistant professors: Dorryl L. Buck (St. Luke's Hospital, Cedar Rapids, Iowa), David L. Witte (Laboratory Control, Ltd., Ottumwa, Iowa)
Graduate degree offered: M.S. in Pathology

The department offers basic pathology courses to health science students; a clinical training program in medical technology; a master's degree program; residency training programs leading to American Board of Pathology certification in anatomic pathology, clinical pathology, and neuropathology; a postdoctoral training program in clinical chemistry; fellowship training in pathology subspecialties; and postdoctoral research training in cellular and molecular pathology.

Programs

Clinical Education in Medical Technology

See "Division of Associated Medical Sciences" in this section of the *Catalog*.

Master of Science

The M.S. program in pathology is open to students with various educational backgrounds. The department particularly encourages applications from students with Bachelor of Science degrees in chemistry, biochemistry, biology, zoology, and medical technology, and from students with medical and dental degrees.

The M.S. program is flexible, but the department emphasizes two tracks, one to provide a research background for academically oriented resident physicians and for medical and dental students, the other for medical technologists who want to advance their training, usually by subspecialization in an area of laboratory medicine.

M.S. students participate in teaching, patient care, and research through the instructional programs of the department, the service laboratories of the department and The University of Iowa Hospitals and Clinics, and faculty members' research laboratories.

Admission to the M.S. program requires a 3.00 grade-point average in science courses, a Graduate Record Examination (GRE) Aptitude Test combined verbal and quantitative score above 1200, and a personal interview. A brochure describing departmental course requirements and giving examples of the major academic tracks is available on request.

Residency Program

The department is approved for 21 residency positions in pathology, covering a training span of up to five years. The programs are designed to utilize the patient population of The University of Iowa Hospitals and Clinics and the Iowa City Veterans Affairs Medical Center.

There is systematic rotation through the various laboratory services, including surgical pathology, autopsy pathology, cytology, clinical chemistry, clinical microbiology, hematology, immunopathology, and transfusion center. There is also opportunity for one or two years of additional fellowship training in most pathology subspecialties.

The department also offers a postdoctoral training program in clinical chemistry for biochemists and chemists. This program is approved by the American Board of Clinical Chemistry.

In addition, the department provides five 12-month externships and a variable number of clerkships for predoctoral students in any of the areas of anatomical and clinical pathology.

Postdoctoral Training

The Department of Pathology offers postdoctoral programs in hematopathology, neuropathology, and surgical pathology for physicians who have completed at least two years of residency training in pathology. The postdoctoral traineeship consists of one year of diagnostic work and one year of laboratory research in basic hematopathology.

The department also provides postdoctoral training in immunology, neuropathology, biochemistry of hemostasis, cancer biology, and clinical microbiology, as well as in other areas of cellular and molecular pathology. These positions are open to individuals with either Ph.D. or M.D. degrees.

Facilities

The Department of Pathology administers the clinical laboratories of The University of Iowa Hospitals and Clinics. Most of these laboratories are located in 40,000 square feet of newly constructed laboratories. The Department of Pathology has individual research laboratories and core facility laboratories located in the Medical Research Center, Medical Laboratories, and at the Veterans Affairs Medical Center. The department is well-equipped to carry out the sophisticated technology of modern cellular and molecular pathology. Also available are the College of Medicine Core Laboratories for recombinant DNA studies, hybridoma production, flow cytometry, and laboratory animal care.

Courses

69:000 Cooperative Education Internship **0 s.h.**
Students work in a hospital, research, environmental, or industrial laboratory setting. Open only to medical technology students.

69:1 Introduction to Clinical Laboratory Science **1 s.h.**
Surveys the role of various laboratories and laboratory professionals in health care delivery, including environmental, research, hospital, and industrial laboratories.

69:104 Principles of Human Pathology **1 s.h.**
Terms, mechanisms, and principles of disease and the ability to communicate these in simple terms. Open only to graduate students in nutrition. Offered fall semesters.

69:112 Medical Jurisprudence **arr.**

69:119 Instrumentation in Clinical Laboratory Science **3 s.h.**
Theory and practice of the instrumentation used in clinical laboratories. Open only to medical technology students. Offered spring semesters.

69:120 Clinical Microscopy for Medical Technologists **1 s.h.**
Theory and practice of clinical laboratory science as used in the study of various body fluids; review of basic laboratory techniques. Open only to medical technology students.

69:121 Immunology for Medical Technologists **1 s.h.**
Theory and practice of clinical immunology, including methodology. Open only to medical technology students.

69:122 Clinical Chemistry for Medical Technologists **5 s.h.**
Theory and practice of analytical biochemistry applied to disease states, including methodology, automation, and reagent preparation. Open only to medical technology students.

69:123 Immunohematology for Medical Technologists **3 s.h.**
Theory and practice of coagulation and blood banking, including donor services. Open only to medical technology students.

69:124 Clinical Hematology for Medical Technologists **5 s.h.**
Theory and practice of laboratory hematology as applied to pathologic states, including methodology and automation. Open only to medical technology students.

69:125 Microbiology for Medical Technologists **6 s.h.**
Theory and practice of laboratory microbiology applied to pathogenic microorganisms, including bacteria, parasites, fungi, and viruses. Open only to medical technology students.

69:126 Clinical Chemistry for Medical Technologists **5 s.h.**
Clinical rotation through The University of Iowa Hospitals and Clinics, Veterans Affairs Medical Center, or other clinical chemistry laboratories. Open only to medical technology students.

69:127 Clinical Immunohematology for Medical Technologists **2 s.h.**
Clinical rotation through The University of Iowa Hospitals and Clinics, Veterans Affairs Medical Center, or other blood banks. Open only to medical technology students.

69:128 Clinical Microbiology for Medical Technologists **5 s.h.**
Clinical rotation through The University of Iowa Hospitals and Clinics, Veterans Affairs Medical Center, or other microbiology laboratories. Open only to medical technology students.

69:129 Clinical Hematology for Medical Technologists **3 s.h.**
Clinical rotation through The University of Iowa Hospitals and Clinics, Veterans Affairs Medical Center, or other hematology laboratories. Open only to medical technology students.

69:130 Clinical Pathology for Physician Assistant Students **arr.**
Theory and practice of selected clinical laboratory techniques and procedures, with emphasis on effective utilization of the clinical laboratory in the diagnosis and management of disease states. Open only to physician assistant students.

69:131 Clinical Laboratory Science Seminar **1-2 s.h.**
Selected topics in clinical laboratory science. Open only to senior medical technology students.

69:132 Parasitology for Medical Technologists **1 s.h.**
Theory and practice in the identification of pathogenic parasites. Open only to medical technology students.

69:134 Clinical Research for Medical Technologists **arr.**
Rotations through selected biomedical research laboratories on The University of Iowa campus. Open only to medical technology students. Consent of program director required.

69:135 Individual Study in Clinical Laboratory Science **arr.**
Selected topics in clinical laboratory science management, education, and research.

69:136 Independent Study in Immunology **1 s.h.**
Selected topics in immunology. Open only to medical technology students.

69:137 Independent Study in Clinical Laboratory Instrumentation **arr.**
Selected topics and laboratory experiences in clinical laboratory instrumentation. Open only to medical technology students.

69:145 Cytotechnology Techniques and Methods **arr.**
Selected experiences in the cytotechnology laboratory. Open only to medical technology cytology track students.

69:150 Medical Cytogenetics **3 s.h.**
Human chromosome structure and morphology; methods and mechanisms of preparative techniques; nature and mechanisms of chromosome abnormalities; cytogenetics of prenatal, cancer, and toxicology testing. Same as 70:150.

69:151 Medical Cytogenetics Laboratory **2 s.h.**
Methods and mechanisms of cytogenetics laboratory procedures, including short- and long-term cultures; chromosome banding and special staining methods; photomicroscopy; case analysis and interpretation. Same as 70:151.

69:152 Medical Cytogenetics Seminar **1 s.h.**
Lectures and discussion on selected topics in cytogenetics. Same as 70:152.

69:155 Clinical Medical Cytogenetics **arr.**
Selected experiences in medical cytogenetics laboratories. Open only to medical technology cytogenetics track students. Same as 70:155.

69:160 Respiratory and Renal Physiology **3 s.h.**
Basic respiratory and renal physiology, including gas exchange, acid-base physiology, fluid and electrolyte balance, and associated pharmacology. Open only to medical technology perfusion track students.

69:161 Introduction to Medical Electronics and Biophysical Monitoring **3 s.h.**
Principles of medical electronic devices used in cardiopulmonary perfusion, including principles and application of basic patient electrical safety. Open only to medical technology perfusion track students.

69:162 Cardiovascular Anatomy, Physiology, and Pathology **5 s.h.**
Cardiovascular anatomy and physiology as it relates to the practice of cardiopulmonary bypass. Open only to medical technology perfusion track students.

69:163 Perfusion Technology I **8 s.h.**
Provides the information necessary to set up and manage the extracorporeal circuit, including in vitro and in vivo laboratory sessions designed to prepare students for clinical cases. Open only to medical technology perfusion track students.

69:164 Perfusion Technology II **5 s.h.**
Continuation of 69:163, with emphasis on specialized perfusion techniques and the diagnosis and management of perfusion emergencies. Open only to medical technology perfusion track students.

69:165 Clinical Perfusion Techniques and Methods **arr.**
Selected experiences in perfusion technology. Open only to medical technology perfusion track students.

69:166 Pharmacology for Perfusionists **2 s.h.**
Theoretical basis and clinical use of pharmaceuticals used during cardiopulmonary bypass. Open only to medical technology perfusion track students.

69:167 Perfusion Seminar **2 s.h.**
Special topics in extracorporeal technology, including

actual clinical problems. Open only to medical technology perfusion track students.

69:168 Perfusion Research **4 s.h.**
Students pursue original research project in cardiopulmonary perfusion or related field. Open only to medical technology perfusion track students.

69:175 Selected Biomedical Research Techniques **arr.**
Selected research and other biomedical laboratory experiences. Open only to medical technology students or to others with consent of program director.

69:201 General Pathology for Medical Students **3 s.h.**
Detailed analysis of basic responses of body, causes of disease, and pathogenic mechanisms of disease; introduction to use of laboratories in medicine; morphologic analysis of basic disease processes. Open only to first-year medical students, or to graduate students with consent of instructor. Offered spring semesters.

69:202 Systemic Pathology for Medical Students **10 s.h.**
Comprehensive analysis of human disease by organ systems and analysis of case problems utilizing morphology and clinical laboratory observations. Open only to second-year medical students, or to graduate students with consent of instructor.

69:203 Introduction to Human Pathology **arr.**
Survey of human disease, including basic disease processes, organ-related diseases, multisystem diseases; discussions specific to needs of each group of students. Offered fall semesters.

69:211 Research in Pathology **arr.**
Research supervised by faculty member relating to basic aspects of pathology or clinical patient material; emphasis on experimental design, methods, literature review, and obtaining formal answers to a specific question. Open only to medical students, or to graduate students with consent of instructor.

69:231 Special Topics in Pathology **arr.**
Individualized study of special topics in pathology arranged with a faculty member. Open only to medical students, or to graduate students with consent of instructor.

69:241 Autopsy Pathology Clerkship **arr.**

69:245 Hematopathology Clerkship **arr.**

69:246 Surgical Pathology Clerkship **arr.**

69:247 Blood Bank Clerkship **arr.**

69:249 Clinical Immunology and Immunopathology: Laboratory and Clinical Correlations **4 s.h.**
Experience in the immunopathology lab and in selected allergy-immunology clinics to maximize clinical and laboratory correlations; participation in weekly conferences and follow-up of lab requests and abnormalities. Open only to fourth-year medical students. Same as 78:253.

69:288 Cellular and Molecular Biology of Neoplasia **3 s.h.**
Introduction to the analysis of neoplasia; basic biological features and some population characteristics of neoplasia; considerations of cell biology and molecular mechanisms; topics in chemical and viral carcinogenesis; introduction to the immunobiology of neoplasia, with emphasis on in-depth analysis and consideration of concepts with supporting literature. Consent of instructor required. Prerequisite: strong basic science background.

69:998 Special Studies on Campus **arr.**

PEDIATRICS

Head: Frank H. Morriss, Jr.
Professors: Adel K. Afifi (Anatomy), Edward F. Bell, William E. Bell (Neurology), Samuel J. Fomon, Charles Grose (Microbiology), James W. Hanson, James C. Hardy (Speech Pathology and Audiology), Dennis C. Harper, Alfred Healy (Special Education), Herman A. Hein, Victor V. Ionasescu, C. Thomas Kisker, Ronald M. Lauer (Preventive Medicine and Environmental Health), Frank H. Morriss, Jr., Arthur J. Nowak (Pediatric Dentistry), Shivanand R. Patil, William J. Rhead, Lynn C. Richman, Jean E. Robillard, Vinton N. Rowley, Wilbur L. Smith (Radiology), Lewis D. Stegink (Biochemistry), James A. Stehbens, Ronald G. Strauss (Pathology), Miles M. Weinberger, Mark L. Wolraich, Ekhard E. Ziegler
Professors emeriti: Lloyd J. Filer, John C. MacQueen, Charles H. Read, Gerald Solomons, Hans Zellweger
Associate professors: Richard C. Ahrens, James F. Bale, Pedro A. De Alarcon, Lois B. Dusdieker, Scott D. Lindgren, Vera A. Loening-Baucke, Larry T. Mahoney (Preventive Medicine and Environmental Health), Gail A. McGuinness, Donald M. Mock, Jeffrey C. Murray, Richard P. Nelson, Stanley Perlman, Charles Rebouche, Raymond Tannous, Michael E. Trigg, Eva Tsalikian, David P. Wacker (Special Education), Jeffrey S. Wagener, Douglas N. Weismann, Jerold C. Woodhead
Associate professor emerita: Dorothy A. Ehmke
Clinical associate professors: Stephen C. Elliott, Jon Fusselman, Donald E. Greydanus, Thomas W. Kelly, Alejandro M. O'Donnell, Peter D. Wallace, Laverne Wintermeyer, Veljko Zivkovich
Assistant professors: Randell C. Alexander, Diane L. Atkins, Roger H. Gilfer, Jody R. Murph, Don C. Van Dyke
Clinical assistant professors: Kenneth W. Anderson, Robert W. Anderson, Siddiq M. Arab, William G. Bartlett, Barry S. Barudin, James F. Boysen, Holly Bzdega, George G. Caudill, B. Chandramouli, Carlyn Christensen-Szalanski, William R. Daws, Ronda Dennis-Smithart, Larry R. Fane, Keevin J. Franzen, Leonard G. Gangeness, Wilmer G. Garrett, Gregory Garvin, Sixto F. Guiang, Stanley A. Hackbarth, James A. Hendrix, Norma J. Hirsch, John C. Justin, Gregorio Kazenelson, Paul G. Koellner, Mary S. Larew, Walter W. Larson, Jean S. LePoidevin, David L. Little, Adel F. Makar, Donald R. McCabe, William C. McCormack, Michael McCubbin, Sharon Means, Debra Miller, Edward G. Nassif, Scott Nair, Everett A. Nitzke, Thomas G. Rosenberger, Rizwan Shah, Robert D. Shaw, Ray C. Sturdevant, Jack T. Swanson, Julianne H. Thomas, Alfonso Torres, James H. Ziska
Associates: Brenda Cruikshank, Julia Lee, Jill H. Morriss, Mary H. Waziri (Pedodontics)

The Department of Pediatrics has designed its educational program to provide a solid foundation for students and those seeking postgraduate training. Extensive opportunities for general pediatrics and the subspecialties are available.

Affiliated programs in the Divisions of Maternal and Child Health-Iowa State Department of Health, Regional Child Health Specialty Clinics, University Hospital School, Blank Memorial Children's Hospital (Des Moines), and the Muscatine Community Health Clinic add depth to the educational program in community pediatrics and primary care.

The Department of Pediatrics is responsible for all facets of the pediatric section of 50:111 Introduction to Clinical Medicine. Didactic lectures and simulated physical examination of the newborn and toddler provide students with their initial pediatric patient contact. This experience includes taking a history, performing a physical, appraisal of growth and development, nutrition and symptomatology of the newborn, toddler, and adolescent.

For the junior and senior medical student, the inpatient service provides an opportunity for training in the complex problems of disease and critical illness. There are daily rounds involving general pediatrics and all subspecialties. Challenging and interesting cases are presented to the staff for discussion of diagnosis and treatment.

Outpatient experience, available in senior electives, stresses principles and practices required for the maintenance of health in children, treatment of common general pediatric disorders, and the diagnosis and treatment of subspecialty ambulatory patients.

Graduate Program

The department offers an approved three-year residency program designed to prepare each trainee for a professional career in the broad field of pediatrics. The program meets the eligibility requirements of the American Board of Pediatrics (ABP).

Fellowships are available in all ABP-approved subspecialties as well as in the major subdivisions of pediatrics. The programs are research and clinically oriented, encouraging development of knowledge and skill in the chosen discipline. Upon satisfactory completion of the program, fellows meet the eligibility requirements of the ABP in the subspecialty.

Facilities

The Department of Pediatrics is located in The University of Iowa Hospitals and Clinics, with inpatient and outpatient areas immediately adjacent to faculty offices and the pediatric library.

The inpatient service comprises more than 140 beds, and more than 25,000 patients are seen each year in the general, specialty, continuity care, and field clinics, and the Emergency Treatment Center.

Laboratories performing both clinical and research studies are maintained in the department.

The University Hospital School is available for children with developmental disabilities, cerebral palsy, or mental retardation.

Courses

70:2 Clinical Pediatrics **6 s.h.**
Principles and practices of health maintenance and treatment of acute and chronic illnesses in children; lectures, demonstrations, participation in patient care, daily rounds, ward work; emphasis on diagnosis and evaluation, nutrition, behavior problems, and survey of important disorders affecting children. For third-year medical students.

70:3 Introduction to Medical Genetics **2 s.h.**

70:12 Nutrition, Growth Care, and Developmental GI **arr.**
Four-week elective emphasizing clinical aspects of growth and pediatric nutrition and gastroenterology, including seminar program, clinical activities, approach to literature, research activities.

70:15 Community Pediatrics: Iowa Methodist Hospital, Des Moines **arr.**
Work in a community-based hospital; experience in care of patients seen in daily practice and in special problems referred to a children's hospital.

70:16 Pediatric Hematology arr.
Basic concepts of hematology; clinical approach to hematological problems and tumors seen in children.

70:17 Pediatric Neurology arr.
Participation in both outpatient and inpatient activities and all teaching activities of the section, including morning ward rounds.

70:19 Pediatric Cardiology arr.
Opportunity to participate in all clinical activities, observing cardiac catheterization, and gaining some expertise in cardiac auscultation, ECG, and radiography; emphasis on physical diagnosis and approach to heart disease and murmurs in pediatric subject.

70:20 The Physically Impaired Child and Young Adult 4 s.h.
Normal developmental sequences of neuromuscular maturation, reflexes, and motor programming; theories of etiology, classification, diagnosis, treatment, and prognosis of cerebral palsy; selected physically handicapping conditions; methods to detect and quantify physical and cognitive impairments; long-term consequences of physical impairments on individuals and their families; research, field experiences.

70:22 Child Abuse 4 s.h.
Legislation regarding child abuse; identification of physical abuse, sexual abuse, and child neglect; examination, documentation, and reporting of child abuse; agencies that work with abused children and their families (DHS, police, courts, social service agencies); interdisciplinary teamwork and its advantages; long-term consequences of child abuse; field experiences.

70:23 Infant and Child Development 4 s.h.
Normal developmental sequences of gestation and early childhood and the impact of environmental influences; antecedents of selected developmental disabilities; methods to detect cognitive and motor delays in the preschool child; long-term consequences of developmental disabilities for children and their families; interdisciplinary teamwork and its advantages; research, field experiences.

70:24 Clinical Management of Developmental Disabilities 4 s.h.
Basic clinical management of major developmental disorders (cerebral palsy, myelodysplasia, attention deficit hyperactivity) by diagnosis work-ups and management; exposure to an interdisciplinary team; long-term consequences of chronic disorders and developmental disabilities; optional research.

70:27 Intermediate Neonatal Intensive Care Unit Nurseries arr.
Increases students' ability to care for the ill neonate and skill in the use of diagnostic tests and procedures; students assume responsibility for the care of a number of infants; review references and current literature about the neonate; participate in conferences, teaching activities, and clinical rounds. Students must be replaced in order to drop course.

70:28 Pediatric Inpatient Care arr.
Students work on a pediatric inpatient team caring for patients ranging in age from infancy through adolescence; they evaluate patients and formulate differential diagnoses, diagnostic work-ups, and appropriate therapy programs. Open only to senior medical students.

70:30 Pediatric Genetics, Cytogenetics, and Neuromuscular Disorders arr.
Students participate in all diagnostic and therapeutic problems presented; learn techniques of evaluating a genetic situation and counseling accordingly; participate in all section conferences.

70:31 Community Pediatrics arr.
Exposure to private practice of pediatrics; students observe and participate with practicing pediatrician in daily office and hospital care of children.

70:32 Pediatric Nephrology/Collagen Vascular Disease 4 s.h.
Supervised participation in renal clinic; collagen vascular clinic; inpatient service and outpatient consultations; students participate in all section conferences.

70:33 Pediatric Gastroenterology arr.
Diagnosis, management, and treatment of various diseases of the gastrointestinal tract, liver, and pancreas in the pediatric age group; ward rounds, consultations, clinics, diagnostic procedures, section conferences; four-week clinical program.

70:39 Pediatric Infectious Diseases arr.
Diagnosis and management of infectious diseases in infants and children; microbiologic and pharmacologic principles related to antibiotic use; diagnostic microbiology. Consent of instructor required.

70:42 Newborn Intensive Care Unit, Raymond Blank Memorial Hospital arr.
Work in a 36-bed unit, well-staffed and well-equipped Level II NICU.

70:43 Pediatric Allergy arr.
Students obtain historical data for diagnosis of ambulatory patients and inpatients, perform and interpret pulmonary function and skin tests, and learn appropriate management of diseases.

70:50 Pediatric Bone Marrow Transplant Service 4 s.h.
Intensive education in hematologic support and infectious disease management of pediatric bone-marrow transplant patients; consultation, care, and follow-up.

70:51 Adolescent Behavioral Medicine I 4 s.h.
Students increase their skill in interviewing depressed teenagers and widen their knowledge base of adolescent behavioral disorders; therapeutic modalities, including behavioral modification and psychopharmacology; clinical activities, daily rotation, daily staffings, lectures; close work with a few patients; work at Blank Children's Hospital, Des Moines. Open only to medical students. Prerequisite: 70:2.

70:53 Outpatient Subspecialty Rotation 4 s.h.

70:54 Alaska Native Health Service Pediatric 4 s.h.
Students work half-time on the infant ward and half-time in the pediatric clinic, performing duties appropriate to their level of training.

70:55 General Pediatric Outpatient Clinic 4 s.h.
Students work in general pediatric outpatient clinics with patients who are acutely or chronically ill, and with well children.

70:102 Pediatrics Elective for Physician Assistant Students arr.

70:150 Medical Cytogenetics 3 s.h.
Human chromosome structure and morphology; methods and mechanisms of preparative techniques; nature and mechanisms of chromosome abnormalities; cytogenetics of prenatal, cancer, and toxicology testing. Prerequisites: cell or molecular biology, genetics, biochemistry, or consent of instructor. Same as 69:150.

70:151 Medical Cytogenetics Laboratory 2 s.h.
Methods and mechanisms of cytogenetics lab procedures, including short- and long-term cultures, chromosome banding and special staining methods, photomicroscopy, case analysis and interpretation. Corequisite: 70:150. Same as 69:151.

70:152 Medical Cytogenetics Seminar 1 s.h.
Lectures and discussion on selected topics in cytogenetics. Same as 69:152.

70:155 Clinical Medical Cytogenetics arr.
Same as 69:155.

70:161 Human Genetics 2 s.h.
Concepts of genetics as they relate to human research; emphasis on quantitative genetic approaches to cardiovascular disease and human gene mapping and its implications. Offered spring semesters of odd years. Prerequisite: undergraduate genetics.

70:201 Applications of Primary Health Care Concepts in Children and Adolescents 3 s.h.
Same as 96:224.

70:245 Evaluation of Children with Learning Disabilities arr.
Students participate in pediatric psychology learning disability clinic for training and experience in assessment, interview, and research. Consent of instructor required. Same as 7P:207.

70:246 Pediatric Psychology arr.
Comprehensive review of the diagnosis and treatment of common psychological problems in a pediatric setting; includes readings and/or clinical experience relative to psychosomatic problems, learning disorders, physical disability, neuropsychology of children. Same as 7P:208.

70:247 Neuropsychology of Learning Seminar 3 s.h.
Approaches to learning disability; language, visual-perceptual, and reading disabilities; serial order and memory deficits reviewed from perspectives including developmental neuropsychology, genetic basis of learning disability, brain damage models, and cognitive psychology; emphasis on clinical and statistical approaches to typologies in learning disability. Offered fall semesters. Consent of instructor required. Same as 7P:209.

70:249 Advanced Practicum in Child and Adolescent Personality Assessment 3 s.h.
Participation in pediatric psychology clinic for training and experience in assessment, interviewing, and psychological report writing; critique of personality instruments and text in personality assessment for children.

70:250 Social Psychology of Disability 3 s.h.
Advanced research seminar exploring social psychology of disability; critical examination of issues in mental/physical disability from the individual and societal perspective; emphasis on clarifying research and theoretical strategies in psychology of disability. Open only to doctoral students. Consent of instructor required. Same as 7P:210.

70:251 Clinical Pediatric Neuropsychology arr.
Children's learning and behavior disorders resulting from central nervous system dysfunction; supervised clinical experience in assessment of the cognitive and behavioral patterns of such children. Consent of instructor required.

70:252 Assessment of Attention Deficit Disorder 3 s.h.
Students participate in a variety of clinical, research, and didactic opportunities in the course of evaluating children with attention deficit disorder. Prerequisite: experience in intellectual assessment of children.

70:253 Assessment of Behavior Disorders arr.
Supervised experience in completing diagnostic and behavioral assessments of children with conduct disorders.

70:300 Pediatric Independent Study arr.

70:555 Pediatrics for Physician Assistant Students arr.

70:653 Adult and Pediatric Nephrology and Hypertension arr.
Same as 78:653.

70:662 Medical and Pediatric Endocrinology arr.
Same as 78:662.

70:998 Special Studies on Campus arr.
Individually arranged electives; must be submitted 60 days prior to beginning of rotation.

70:999 Special Studies off Campus arr.
Same description as for 70:998.

PHARMACOLOGY

Head: P. Michael Conn
Professors: Mario Ascoli, Jeffrey Baron, Ranbir Bhatnagar, Michael Brody, P. Michael Conn, Gary R. Dutton, Gerald Gebhart, Donald Heistad, A. Kim Johnson, John Long, Thomas Shires, James Spratt, William Steele, Thomas Tephly, Harold Williamson
Assistant professors: Rory Fisher, Barry Kasson, Sean Murphy
Graduate degrees offered: M.S., Ph.D. in Pharmacology

The department provides professional training in pharmacology for health science students, offers a Master of Science program in clinical pharmacology for students with the M.D. degree, and offers a doctoral program of didactic and research experience.

For qualified graduate students, research and training programs are available in biochemical pharmacology and drug metabolism, cardiovascular and renal pharmacology, cellular and molecular pharmacology, chemical and carcinogen pharmacology, endocrine pharmacology, neuropharmacology, and toxicology.

The department participates with other departments in educational and research activities such as the Medical Scientist Training Program, the Physician Scientist

Program, the Neuroscience Program, the Cell and Molecular Biology Program, the Core Center: Diabetes and Endocrinology, the Cancer Center, and the Cardiovascular Research Center.

The department pioneered the offering of pharmacology to undergraduate students with little or no science background. The lecture and discussion sessions in 71:120 Drugs: Their Nature, Action, and Use emphasize the mechanisms of drug action and give students a background for rational decisions concerning the personal use of drugs.

The department offers research training in all areas of pharmacology and toxicology at the predoctoral and postdoctoral levels to prepare students for career opportunities in teaching, government, and industry.

Prerequisites for graduate study include undergraduate background in chemistry, biology, and mathematics. The level of performance in undergraduate courses must be in the top quartile.

Graduate Programs

Master of Science

In cooperation with clinical departments in the College of Medicine, the Department of Pharmacology offers a Master of Science degree program in clinical pharmacology to applicants who already hold the Doctor of Medicine degree. The specific objective of this program is to provide increased emphasis on and training in the science of clinical pharmacology for residents in the various clinical specialties.

Completion of the M.S. program requires a minimum of two years. Satisfactory completion of the following core courses is mandatory unless specifically waived by the Department of Pharmacology faculty. Any of these course requirements may be waived at the request of the trainee if his or her adviser and the departmental faculty agree that the trainee has met them satisfactorily at a prior time.

71:203 Pharmacology Research
71:204 Pharmacology Seminar
71:206 Biochemical Pharmacology
71:210 Special Topics in Pharmacology
63:167 Bioassay
71:212 Toxicology
78:380 Clinical Pharmacology and Therapeutics Lecture Series

The trainee may audit 71:105 Pharmacology for Health Sciences: Medical and may take additional courses in pharmacology or in other departments appropriate to his or her program.

Eligibility for the M.S. degree in pharmacology satisfactory preparation and defense of a research thesis.

Doctor of Philosophy

Course requirements for the Ph.D. in pharmacology are as follows:

71:100 Chemobiodynamics
99:130 Biochemistry and Molecular Biology II
72:212 Medical Physiology
71:101 Pharmacology for Health Sciences: Pharmacy
63:167 Bioassay
71:103 Pharmacology and Toxicology
71:206 Biochemical Pharmacology
71:203 Pharmacology Research
71:204 Pharmacology Seminar
71:207 Neuropharmacology

The student must complete at least one additional course in his or her area of interest; individual faculty research advisers may require more than one.

There is no departmental foreign language requirement.

Students are expected to obtain maximum laboratory research experience during the first two years. As prerequisite to the comprehensive examination and in lieu of a preliminary examination, students must submit to the director of graduate studies a manuscript of progress report detailing research accomplished during the first two years of study. After reviewing this report with a committee of the faculty, the students begin or continue their Ph.D. thesis research. The Ph.D. comprehensive examination (written and oral) is given at the end of the fifth semester. Satisfactory preparation and oral defense of the thesis complete the program.

Financial Aid

Financial support is available for all predoctoral and postdoctoral students in pharmacology.

Courses

71:100 Chemobiodynamics **1 s.h.**
Philosophical and experimental approaches to drug design; emphasis on concepts and tools of biological research; chemobiodynamics and receptor theory. Offered fall semesters. Consent of instructor required.

71:101 Pharmacology for Health Sciences: Pharmacy **5 s.h.**
General principles of pharmacology, pharmacologic actions of drugs, and correlation with therapeutic uses. Open to students in pharmacy, or to qualified graduate students with consent of course director. Offered fall semesters. Consent of instructor required. Prerequisites: 72:150 and 99:162, or equivalent.

71:103 Pharmacology and Toxicology **3 s.h.**
Continuation of 71:101; systemic and organ-specific toxic responses, major toxic substances and their mechanisms of action. Open to graduate students with consent of course director. Offered spring semesters. Prerequisite: 71:101 or equivalent. Recommended: 69:203 or equivalent.

71:105 Pharmacology for Health Sciences: Medical **5 s.h.**
General principles of pharmacology, pharmacologic actions of drugs, and correlation with therapeutic uses. Offered fall semesters. Consent of instructor required. Prerequisites: 72:212 and 99:163, or equivalent.

71:111 Pharmacology for Health Sciences: Dental **5 s.h.**
General principles of pharmacology, pharmacologic actions of drugs, and correlation with therapeutic uses. Offered spring semesters. Prerequisites: 72:152 and 99:161, or consent of instructor.

71:115 Undergraduate Research Independent Study **1-2 s.h.**
Research on drugs and chemicals that influence biological systems.

71:120 Drugs: Their Nature, Action, and Use **2 s.h.**
Principles of drug action and drug toxicity; antibiotics, oral contraceptives, sedatives, stimulants, hallucinogens, narcotics, and others. Not open to students in the health sciences. Offered spring semesters.

71:125 Pharmacology for Health Sciences: Physician Assistant Students **6 s.h.**
General principles of pharmacology, pharmacologic actions of drugs, and correlation with therapeutic uses. Offered fall semesters. Prerequisites: 99:164 and 72:150, or consent of instructor.

71:130 Intermediate Pharmacology **3 s.h.**
Fundamental principles of pharmacology and action, absorption, disposition, metabolism, excretion, and toxicity of various classes of drugs. Open to undergraduate students with background in biochemistry and physiology. Offered spring semesters. Prerequisites: undergraduate biochemistry and physiology courses, or consent of instructor.

71:132 Intermediate Pharmacology **3 s.h.**
Offered spring semesters. Enrollment in College of Nursing required. Prerequisites: undergraduate biochemistry and physiology.

71:203 Pharmacology Research **arr.**
Consent of department head required.

71:204 Pharmacology Seminar **1 s.h.**
Consent of department head required.

71:205 Advanced Cardiovascular Pharmacology and Physiology **2 s.h.**
Recent developments in cardiovascular pharmacology, physiology, and pathophysiology of cardiovascular disease. Offered fall semesters of odd years. Consent of instructor required.

71:206 Biochemical Pharmacology **3 s.h.**
Basis for drug effects on the molecular and biochemical systems of the cell and actions of these systems on drug molecules; specific considerations include membrane functions, protein and nucleic acid synthesis, intermediary metabolism, pharmacokinetics, drug metabolism, and enzyme induction and turnover. Offered fall semesters of odd years. Consent of instructor required. Recommended: strong background in biochemistry and pharmacology.

71:207 Neuropharmacology **3 s.h.**
Pharmacological mechanisms by which neuroeffector function can be modified, including actions on cell ultrastructure, membrane excitability, neurotransmitter synthesis and degradation, and integrated neuronal activity. For students who contemplate research and teaching in neuropharmacology. Offered fall semesters of even years. Consent of instructor required. Prerequisite: medical physiology background.

71:208 Clinical Pharmacology Seminar Series **1 s.h.**
Reviews of timely therapeutic subject matter. Consent of instructor required. Prerequisite: Ph.D., M.D., or graduate training in pharmacology/therapeutics. Same as 78:208.

71:210 Special Topics in Pharmacology **arr.**
Consent of department head required.

71:212 Toxicology **2 s.h.**
Selected topics in pharmacologic toxicology; emphasis on drug-induced injury, mechanisms of toxicity, prenatal and neonatal toxicity, drug safety evaluation, forensic and environmental toxicology. Offered spring semesters of odd years. Consent of course director required. Prerequisite: 71:101 or equivalent.

71:215 Topics in Neuropharmacology **1 s.h.**
Recent advances in neuropharmacology, developmental neurobiology, neuroendocrinology, and related neurosciences; selected topics represented by published articles. Consent of instructor required.

71:225 Topics in Molecular Pharmacology **1 s.h.**
Recent advances in molecular pharmacology; receptor and postreceptor events in stimulus coupling; selected topics represented by published articles. Consent of instructor required.

71:235 Topics in Pain and Analgesia **1 s.h.**
Recent advances in pain research and therapy; research reports by students and faculty, occasional outside speakers, and selected topics represented by published articles. Consent of instructor required.

71:244 Behavioral Neuroscience **2 s.h.**
Lecture and laboratory; basic principles of molecular, cellular, developmental, and behavioral neuroscience. Offered fall semesters. Consent of course director required. Same as 31:244, 132:244.

71:260 Introduction to Pharmacokinetics **1 s.h.**
Problem-oriented approach to basic principles in pharmacokinetics; analysis of data from the scientific literature. Open only to pharmacology graduate students. Offered summer sessions of odd years. Prerequisite: 71:101 or 71:105 or 71:111 or consent of instructor.

71:272 Seminar in Cellular and Molecular Biology **1 s.h.**
Research reports by students and faculty, occasional outside speakers; topics include information transfer and regulation, assembly and developmental processes, membranes, and transport. May be repeated. Enrollment in cellular and molecular biology research training program or consent of instructor required. Same as 37:272, 60:272, 61:272, 72:272, 99:272.

71:380 Clinical Pharmacology and Therapeutics Lecture Series **2 s.h.**
Rational pharmacologic approaches to treatment of disease in humans. Offered spring semesters. Same as 78:380. Open only to fourth-year medical students or to others with consent of instructor.

PHYSICAL THERAPY

See "Division of Associated Medical Sciences."

PHYSICIAN ASSISTANT PROGRAM

See "Division of Associated Medical Sciences."

PHYSIOLOGY AND BIOPHYSICS

Head: Robert E. Fellows
Professors: Francois M. Abboud (Internal Medicine), Kevin P. Campbell, Robert E. Fellows, Carl V. Gisolfi (Exercise Science), Richard A. Maurer, Michael J. Welsh (Internal Medicine), Charles C. Wunder
Professor emeritus: G. Edgar Folk, Jr.
Associate professors: Jeffrey E. Pessin, Thomas J. Schmidt
Associate professors emeriti: Charles J. Imig, Gordon W. Searle
Assistant professors: Mary B. Boyle, Hollis Cline, Wayne Johnson, Roberto Malinow, Scott Moye-Rowley, Andrew Russo, Deborah Segaloff, Erwin F. Shibata
Graduate degrees offered: M.S., Ph.D. in Physiology and Biophysics

The Department of Physiology and Biophysics offers graduate study leading to the Doctor of Philosophy degree; provides instruction in physiology and biophysics for medical, dental, pharmacy, nursing, and other health professional students; participates in the Medical Scientist Training Program, a combined M.D.-Ph.D. program conducted under the auspices of the Graduate College and the College of Medicine; and offers a Master of Science degree.

Research Interests

The major research interests of the department are in hormone receptors and signal transduction, molecular endocrinology and regulation of gene expression, synaptic transmission and neuronal differentiation, membrane ion channels and regulation of excitability, and cardiovascular electrophysiology and regulation.

Graduate Program

The graduate program in physiology and biophysics is designed to provide broad general knowledge of fundamental life processes at molecular, cellular and organ levels, as well as an opportunity for intensive study in major areas of physiology and biophysics with emphasis on endocrinology, membrane biology, and neuroscience. The program focuses on the development of modern research skills and their application in the conduct of original dissertation research.

Entering students are advised by the director of graduate studies, who provides guidance in the planning of a program of formal course work and an introduction to research activities of departmental faculty. The core curriculum includes two semesters of cell biology, two semesters of either molecular biology or neurophysiology, and one semester of medical physiology. The department also offers advanced, specialized courses in membrane physiology, endocrine physiology, environmental and exercise physiology, and neurophysiology. Students elect to take courses in other departments appropriate to their educational and research objectives.

After completing course work and performing satisfactorily on a comprehensive examination based on an original research proposal, students devote full time to original research that culminates in the preparation of a doctoral dissertation and its defense in a final oral examination.

All degree candidates have supervised experience as classroom instructors and teaching assistants as part of their graduate programs.

Financial Aid

All full-time doctoral students receive financial aid in the form of tuition and stipend support from the Department of Physiology and Biophysics. Support is renewed annually based on satisfactory academic progress.

Facilities

The Department of Physiology and Biophysics occupies two floors devoted to research and teaching in the Bowen Science Building and has additional laboratory facilities in the Eckstein Medical Research Building and at the nearby Oakdale campus. In addition to specialized equipment in faculty research laboratories, the department has extensive microcomputer facilities with direct access to University mainframe and minicomputers and a computer imaging facility. The department also provides fluorescence microscopy, isotope analyzers, and equipment for cell culture and molecular biology. Graduate students are provided with study space near the departmental library, which supplements resources available at the Hardin Library for the Health Sciences.

Admission

Applicants for graduate admission must complete undergraduate studies in an accredited institution prior to matriculation with an overall science grade-point average of at least 3.00, coupled with a combined verbal and quantitative score higher than 1200 on the Graduate Record Examination (GRE) General Test. The appropriate background for graduate study in cellular and molecular physiology and biophysics is an undergraduate major in one of the biological, chemical, physical, mathematical, or engineering sciences with appropriate course work in biology, genetics, physics, chemistry and calculus.

Courses

72:130 Human Physiology **4 s.h.**
Basic concepts of human physiology. Offered fall semesters. Open to dental hygiene, pre-physical therapy, exercise science, and pre-nursing students, or to others with consent of instructor. Sophomore or higher standing required. Prerequisite: 37:1 or 4:7-8 with a grade of C or higher.

72:150 Intermediate Physiology **4 s.h.**
Principles of physiology; organ system and cell function. Offered spring semesters. Consent of course director required.

72:152 Mammalian Physiology **4 s.h.**
Principles of physiology; organ system and cell function. Open only to dental students. Offered spring semesters. Consent of course director required.

72:154 Biomedical Engineering Physiology **4 s.h.**
Principles of physiology; organ system and cell function. Open only to biomedical engineering students. Offered spring semesters. Consent of course director required.

72:164 Human Physiology for Physician Assistant **4 s.h.**
Principles of physiology; organ system and cell function. Open only to physician assistant students. Offered summer sessions.

72:199 Research, Independent Study **arr.**
For students who are not candidates for advanced degrees in the Department of Physiology and Biophysics. Consent of instructor required.

72:203 Molecular Endocrinology **2 s.h.**
Mechanisms of hormonal action, including cyclic AMP function, transcription, translation, and transport; molecular processes from hormone receptor interactions to biochemical and biological responses. Offered even years. Consent of course director required.

72:204 Cellular Endocrinology **2 s.h.**
Hormone synthesis, secretion, transport, and target cell interaction; integration of hormone activities; regulation of complex physiological phenomena, including reproduction. Offered odd years. Consent of course director required.

72:212 Medical Physiology **6 s.h.**
Principles of human physiology; organ system and cell function. Open to graduate degree candidates with adequate preparation in biological and physical sciences. Offered spring semesters. Consent of course director required.

72:220 Cell Biology I **3 s.h.**
Organization and function of the eukaryotic cell. Offered fall semesters. Consent of course director required.

72:222 Cellular Neurophysiology **2 s.h.**
Cellular basis of nervous system function; properties of nerve cells—mechanisms of transmission, transduction, and integration. Offered fall semesters. Consent of instructor required.

72:224 Advanced Topics in Neurobiology **2 s.h.**
Lectures and seminars covering advanced concepts of developmental, molecular, sensory, and motor system neuroscience. Offered fall semesters. Consent of instructor required.

72:225 Cell Biology II **3 s.h.**
Organization and function of the eukaryotic cell. Offered spring semesters. Consent of course director required.

72:234 Medical Neuroscience **4 s.h.**
Lecture and laboratory; basic principles of neurophysiology and neuroanatomy, with emphasis on the human central nervous system; laboratory involves anatomical study of spinal cord and brain. Offered spring semesters. Consent of course director required. Same as 50:234, 60:234, 132:234.

72:241 Structure and Function of Biological Membranes **2 s.h.**
Biological membrane structure and function at the cellular and molecular level; topics include lipid-protein interaction, membrane synthesis, endocytosis and fusion, active and coupled transport, membrane asymmetry and fluidity, and hormone receptors. Offered even years. Consent of course director required.

72:243 Biophysics of Excitable Membranes **2 s.h.**
The basis of excitability as found in nerve and muscle cells, including the generation of resting and action potentials, synaptic transmission, propagation of action potentials, and properties of cardiac cell membranes. Offered odd years. Consent of course director required.

72:262 Environmental Physiology **2 s.h.**
Physiological responses, including acclimatization of mammals to extreme heat, cold, light, high and low pressure, space, and smog; laboratory exercises on telemetry, meteorological measurements, and activity recording. Offered odd years. Consent of instructor required. Prerequisite: 72:150 or equivalent.

72:265 Neuroscience Seminar **0-1 s.h.**
Discussion of current literature in research areas bearing on neurosciences and behavior. Consent of course director required. Same as 37:265, 60:265, 31:265, 132:265.

72:272 Seminar in Cellular and Molecular Biology **1 s.h.**
Current research and literature in cell and molecular biology, including information transfer and regulation, assembly and developmental processes, membranes, and transport. Consent of course director required. Same as 37:272, 60:272, 61:272, 71:272, 99:272.

72:274 Exercise Physiology Seminar **2 s.h.**
Acute and chronic effects of exercise on specific biological systems. Offered spring semesters. Consent of course director required. Prerequisites: 72:212 or 72:150, and 99:130. Same as 27:274.

72:290 Special Topics **arr.**
Consent of director of graduate studies required.

72:302 Research Physiology and Biophysics **arr.**
Open only to candidates for advanced degrees in physiology and biophysics.

72:342 Graduate Physiology Seminar **1 s.h.**
Open only to candidates for advanced degrees in physiology and biophysics.

72:402 Thesis **arr.**
Open only to candidates for advanced degrees in physiology and biophysics.

PREVENTIVE MEDICINE AND ENVIRONMENTAL HEALTH

Head: Robert B. Wallace
Professors: Leon Burmeister, William Clarke, Kelley Donham, William Haulser, Shu Ying Hsu, James A. Merchant, William Popendorf, Richard D. Remington, Robert B. Wallace, Robert Woolson
Professors emeriti: Clyde Berry, Peter Isacson, L.W. Knapp, Jr., Keith Long, Donald Morgan
Adjunct professor: John Berg
Associate professors: Trudy Burns, Jon Lemke, Paul Pomrehn, Helmut Schrott, Elaine Smith
Associate professors emeriti: Franklin Kilpatrick, Kenneth MacDonald, Marcus Powell
Adjunct associate professors: Mark Albanese, Roger Tracy
Assistant professors: Elizabeth Chrischilles, Charles Davis, Michael Jones, Burton Kross, Charles Lynch, Ronald Munger, Mustafa Selim, Peter Thorne
Assistant professor emerita: Lois Boulware
Adjunct assistant professors: Russell Currier, David Drummond, Kristi Ferguson, Joel Leininger, Linda Snetselaar
Associate: Laurence Fuortes
Graduate degrees offered: M.S., Ph.D. in Preventive Medicine and Environmental Health

Preventive medicine relates to the individual patient when knowledge and techniques from biological, medical, social, and behavioral science are applied to prevent disease or its progression. It relates to the health of the entire community when the knowledge and skills of medical and allied sciences are applied in an organized community effort to maintain and improve the health of populations.

Departmental research and teaching activities are conducted within three primary divisions: biostatistics, epidemiology, and occupational and environmental health. Faculty of the division of biostatistics work closely with both clinical and basic science investigators throughout the health center in the initial design and subsequent analysis of research projects; they also work independently in studying problems of statistical theory and developing new analytic methods. Concerns of the epidemiology faculty include health care organization and delivery, risk factors for disease in the general population, behavioral factors in disease, and the establishment and evaluation of disease control measures in the community. Occupational and environmental health faculty are concerned with assessment factors in the physical environment and their relationship to disease. Of particular interest are the health problems of agricultural and industrial workers.

Examples of ongoing departmental resources and activities include the State Health Registry of Iowa, which records in central files data on all cases of cancer and birth defects that occur in residents of Iowa; the Aging Project, which examines health problems and needs of a representative segment of Iowa's elderly; the development, evaluation, and field testing of vaccine against schistosomiasis (snail fever); the University Occupational Health Service; the Community Pesticide Project; the Biostatistical Consulting Service; and the Center for the Health Effects of Environmental Contamination.

Within the Division of Biostatistics, the Clinical Trials Data Management Center serves the statistical design, data management, and analysis needs of a variety of multicenter clinical trials, including studies of new treatments for Alzheimer's disease and acute ischemic stroke.

The department sponsored development of the Institute of Agricultural Medicine and Occupational Health, the first agency in the Western Hemisphere dedicated to the study of the occupational health problems of the agricultural worker.

All departmental programs are enhanced through affiliations with the University Hygienic Laboratory, the Environmental Health Service, the Graduate Program in Hospital and Health Administration, the Program in Health and Development in Agrarian Societies (HADAS), the Health Services Research Center, and the Department of Internal Medicine's division of clinical epidemiology.

Graduate Programs

The master's program offers a degree with emphasis in occupational and environmental health, biometry, or community health. Admission to the community health track is limited to those who already are health professionals. The Ph.D. program is available with an emphasis in epidemiology, biometry, or occupational and environmental health.

While pursuing a degree, students are expected to maintain a 3.00 grade-point average. In addition, students who receive 7 semester hours or more of grades of C or lower in departmental course work are dismissed from the program.

Joint master's options exist between the Program in Urban and Regional Planning and the Department of Preventive Medicine and Environmental Health in the College of Medicine. This option results in an M.A. or an M.S. in planning and an M.S. in preventive medicine and environmental health. Separate admissions to both academic units are required.

The combined graduate-level course of study between the Physician Assistant Program and the Department of Preventive Medicine and Environmental Health provides a broad foundation in preventive medicine. The three-year integrated curriculum consists of 26 semester hours of graduate courses in epidemiology, environmental health, biostatistics, and preventive medicine, and 95 semester hours of courses made up of the standard core baccalaureate curriculum of the Physician Assistant Program.

Electives may be selected from a wide range of course offerings in the department of preventive medicine and in other departments in the College of Medicine. Upon completing the program, students earn a B.S. degree in the Physician Assistant Program from the College of Medicine and an M.S. degree in preventive medicine from the Graduate College. Separate admission to both academic units is required. The program is described in detail under "Physician Assistant Program" in the Division of Associated Medical Sciences section of the *Catalog*.

Institute of Agricultural Medicine and Occupational Health

The Institute of Agricultural Medicine and Occupational Health is housed in the Agricultural Medicine Research Facility on the Oakdale campus. Research, teaching, and extension activities concern the safety and health problems of industrial and agricultural workers. Areas of study include environmental health, comparative medicine, industrial hygiene, occupational medicine, and rural health.

Financial Aid

A limited number of research assistantships, traineeships, and tuition grants are available within the department.

Admission

Application deadlines are July 15 for fall semester, December 1 for spring semester, and May 1 for the summer session. These deadlines apply both to University of Iowa and non-University of Iowa students.

Minimum grade-point average requirements are 2.70 for admission to the master's program and 3.00 for the Ph.D. Applicants must have taken the Graduate Record Examination (GRE) Aptitude Test (the acceptable score for most students is a combined verbal and quantitative score of 1050). Also, if required by the University Foreign Admissions Office, non-U.S. citizens must complete the Test of English as a Foreign Language (TOEFL). A minimum combined score of 600 is considered acceptable for most students.

Applicants must have an undergraduate major or course background in science or mathematics, depending on their proposed program of graduate study. However, in order to be considered for admission to the master's program with emphasis on community health, applicants as a rule must already possess or be pursuing an advanced degree in the health sciences and wish to apply preventive medicine and environmental health principles to their respective professional activities.

Applicants who meet the requirements for the M.S. or Ph.D. programs but who do not want to work toward an advanced degree may be admitted on "professional improvement" status.

Also, applicants are required to specify on the application form the program (track) to which they are applying, to forward three letters of recommendation, and to submit a short description of their professional goals and why they want the degree.

Courses

63:000 Cooperative Education Internship **0 s.h.**
Internship for training occupational and environmental health professionals.

63:105 Preventive Medicine for Physician Assistant Students **1 s.h.**
Develops the scientific basis and principles for clincial prevention and offers instruction on a broad range of preventive skills for physician assistants in the primary care setting. Offered fall semesters. Same as 117:105.

63:109 Preventive Medicine **3 s.h.**
Introduction to epidemiology, clinical preventive medicine, occupational health, organization and delivery of health services, environmental and public health; emphasis on application of skills to disease control and clinical prevention. Open only to second-year medical students. Offered fall semesters.

63:110 Concepts in Biostatistics **1 s.h.**
Development of skills to read and critique the medical literature; descriptive and inferential statistical terminology and methodology introduced through the use of journal articles. Open only to first-year medical students. Offered fall semesters.

63:111 International Health **1-2 s.h.**
Review of the structure and delivery of personal and public health services and their evaluation in developing countries in a political, cultural, and economic context. Offered fall semesters. Open only to sophomore medical students, advanced undergraduates, or graduate students.

63:158 Principles of Epidemiology **3 s.h.**
Design and analysis of case-control and cohort studies; historical and current examples of descriptive and analytic epidemiologic studies; etiologic factors in human disease identified through study of distribution and determinants of disease in man. Offered fall semesters.

63:161 Introduction to Biostatistics **3 s.h.**
Topics include graphs and tables; descriptive statistics; probability; binomial, Poisson, and normal distributions; sampling distributions; tests of significance for one-, two-, and k-sample problems; confidence intervals; frequency data analysis; linear regression and correlation; nonparametric tests. Prerequisite: college algebra.

63:162 Design and Analysis of Experiments in the Biomedical Sciences **3 s.h.**
Linear, polynomial, and multiple regression; residual analysis; regression diagnostics; analysis of covariance, model building; one-way and two-way layouts for fixed, random, and mixed effects models; multiple comparison techniques; orthogonal contrasts. Offered spring semesters. Prerequisite: 63:161 or equivalent. Same as 225:140.

63:163 Introduction to the Design of Sample Surveys **3 s.h.**
Techniques of constructing and analyzing sample surveys, including general methods of estimation, properties of estimators, simple random sampling, stratified sampling, systematic sampling, cluster sampling, modes of data collection, questionnaire construction, randomized response, and survey economics. Offered fall semesters. Prerequisite: 63:161 or equivalent.

63:167 Bioassay **1 s.h.**
Introduction to the application of statistical techniques to biological assay data; one-way and randomized complete blocks of ANOVA, linear regression, potency estimation, direct and indirect assays, Fieller's theorem, unsymmetric and symmetric parallel line assays, transformations, slope ratio assays; emphasis on use of personal computer statistical packages. Offered spring semesters of even years. Prerequisite: 63:161 or 63:176.

63:171 Problems in Preventive Medicine **arr.**
Didactic material in preventive medicine that has not been organized as a formal course; offers study on a tutorial or seminar basis or as faculty-directed independent work, such as a literature search project or as a short research project; arranged between student and instructor.

63:172 Independent Study and Research in Preventive Medicine **arr.**
In-depth pursuit of an area of special interest in preventive medicine; different from 63:171 in that the student is expected to be more creative and independent in designing and carrying out the project (not an extensive or continuing piece of research, such as a thesis project).

63:173 Intermediate Design of Sample Surveys **2 s.h.**
Problems encountered in designing sample surveys, including construction and number of strata, unbiased ratio estimators, problems of systematic sampling, multistaged sampling, double sampling, sampling frame construction, panel studies, and nonresponse. Offered spring semesters of odd years. Prerequisite: 63:163.

63:176 Biostatistical Methods **4 s.h.**
Problems-oriented course; probability distributions, moments, estimation, parametric and nonparametric inference for one-sample and two-sample problems, analysis of frequency data, linear regression, and correlation analysis; emphasis on using computers (computer laboratory session each week). Offered fall semesters. Prerequisite: two semesters of calculus.

63:181 Introduction to Health Care Organization **3 s.h.**
Introduction to basic organizational arrangements of medical services in the United States; determinants of utilization, amount and type of health resources available, method of financing, government regulation; social, political, and economic forces that determine the future of health services. Offered fall semesters. Same as 80:101.

63:191 Occupational Health **3 s.h.**
Introduction to principles and practice of occupational medicine, industrial hygiene and safety, and occupational health management. Offered fall semesters.

63:192 Occupational Safety **3 s.h.**
Introduction to principles and practices of occupational safety in agriculture and industry. Offered spring semesters.

63:193 Industrial Hygiene **2 s.h.**
Introduction to the principles, practices, and tools. Offered fall semesters. Corequisite: 63:191.

63:195 Analytical Toxicology Lecture **3 s.h.**
Separation, identification, and quantitative determination of toxic chemicals and their metabolites in biological and environmental matrices; basic principles and applications of modern instrumental methods of analysis, chemical separation, and concentration techniques. Offered fall semesters. Consent of instructor required.

63:196 Analytical Toxicology Laboratory **3 s.h.**
Hands-on laboratory experience applying advanced analytical methods to separate and identify toxic chemical components in biological and environmental samples; training on state-of-the-art instruments, application of quality control/quality assurance protocols, and interpretation of data obtained from analytical instruments. Offered spring semesters. Prerequisite: 63:195.

63:201 Research in Preventive Medicine and Environmental Health **arr.**
Intended for students engaged in research that may lead to a dissertation.

63:202 Environmental Health **3 s.h.**
Assessment of contemporary human health issues associated with the biological, chemical, and physical factors of the environment; critical review of the environmental factors affecting health; public policies governing recognition, intervention, and control. Offered fall semesters.

63:203 Preceptorship in Preventive Medicine and Environmental Health **arr.**
Individually arranged by students with their adviser in conjunction with ongoing activities in the department, in the College of Medicine, or off campus in a governmental agency or private industry; provides work experience in which the student applies knowledge and skill acquired in the classroom.

63:209 Rural Health and Agricultural Medicine **3 s.h.**
Clinical orientation of specific health problems of rural residents and agricultural workers; topics include rural health care delivery, the farm economic crisis, agricultural occupational health problems, general environmental health hazards in rural areas; for students interested in primary care medicine in rural areas and other health professionals concerned with rural areas. Offered spring semesters. Prerequisites: enrollment in medical curriculum or 63:158 or consent of instructor.

63:232 Advanced Industrial Hygiene **4 s.h.**
Mechanisms of occupational exposure and control of vapors, aerosols, and selected physical agents; management aspects of applied programs. Offered spring semesters. Consent of instructor required. Prerequisite: 63:191.

63:241 Statistical Methods in Epidemiology I **3 s.h.**
Systematic review of methodologic techniques for epidemiologic studies: standardization, estimation of rates and risks, life tables, misclassification, selection, matching, measures of relative risk, stratified analysis, logistic regression analysis, familial aggregation; appropriate computer programs used. Offered fall semesters of even years. Prerequisites: 63:161 and 63:158. Recommended: 63:162.

63:242 Statistical Methods in Epidemiology II **3 s.h.**
Nonparametric and semiparametric methods for survival data; methods of comparing directly standardized rates and standardized mortality ratios; Poisson regression for cohort data. Offered spring semesters of odd years. Prerequisites: 63:162 and 63:241.

63:250 Behavioral Medicine **2 s.h.**
Relation between behavioral sciences and social epidemiology to clinical medicine; methodologic and assessment difficulties in psychosocial medical research; topics include social epidemiology, illness, sick role, health, behavior and prevention, coping and stress, clinician-patient communications. Offered fall semesters of odd years. Consent of instructor required.

63:252 Theories of Environmental Policy and Assessment **3 s.h.**
Major concerns relating to the environment and human health, and the basis on which legislation has been enacted to deal with these concerns; emphasis on contemporary legislation having major effects on environmental policy. Offered spring semesters. Prerequisite: 63:202 or consent of instructor. Same as 53:204.

63:254 Genetics and Epidemiology **3 s.h.**
Survey of genetics and its relationship to epidemiology; first half covers genetic principles, second half covers application of principles to disease states of man. Offered fall semesters of odd years. Prerequisites: introductory biology, biostatistics, and epidemiology; or consent of instructor.

63:255 Psychiatric Epidemiology **3 s.h.**
Survey of epidemiology of mental disorder; special problems in psychiatric epidemiology; reliability and validity; diagnostic classification; epidemiology of specific diseases including dementia, schizophrenia, manic-depression, anxiety neurosis, alcoholism, and personality disorder. Offered fall semesters. Prerequisite: 63:158 or consent of instructor. Recommended: 63:258 or 63:259 or two years of resident training in psychiatry. Same as 73:255.

63:256 Hospital Epidemiology **2 s.h.**
Epidemiological methods applied to positive and negative features of the care of hospitalized patients; classic use of epidemiologic concepts in the description, investigation, and control of hospital risks (infections, drug reactions, accidents, excess costs); collection and use of hospital data for patient care evaluation in the context of current regulatory efforts. Offered spring semesters of odd years. Prerequisite: 63:158 or equivalent.

63:257 Epidemiology of Infectious Diseases **4 s.h.**
Review of underlying epidemiological concepts of infection and disease, causation, methods of transmission, surveillance and sero-epidemiology; epidemiology and control of infectious diseases, including venereal disease, congenital disease, respiratory diseases, enteric diseases, vectorborne diseases; relationship to cancer. Offered fall semesters of odd years. Prerequisite: 63:158 or equivalent.

63:258 Advanced Field Methods in Epidemiology **3 s.h.**
Critical review of epidemiological study design and analysis; adjustment of rates; estimation and comparison of risks; matching; vital statistics; clinical trials and epidemic models; cluster analysis; life tables; analysis of stratified data; logistic regression analysis; data sources, questionnaire design, conduct of surveys, and relation to disease classification; examples taken from acute, communicable, chronic, and genetic diseases, as well as medical care organization and delivery. Offered spring semesters. Prerequisites: 63:158 and 63:161.

63:259 Chronic Disease Epidemiology **4 s.h.**
Standard basic epidemiologic methodology applied systematically to current problems of cancer, cardiovascular disease, respiratory disease, and other major chronic diseases. Offered spring semesters of even years. Prerequisites: 63:158 and 63:161, or consent of instructor.

63:260 Environmental Toxicology **3 s.h.**
Sources, routes of absorption, and effects of environmental toxicants affecting man; pathophysiology of toxicant actions, including those of air and water pollutants, metals, pesticides, solvents, mycotoxins, food toxicants, and other chemicals. Offered spring semesters. Prerequisite: chemistry, physiology, or biochemistry.

63:261 Survival Data Analysis **3 s.h.**
Product limit estimators; life table methods; parametric likelihood inference using exponential, Weibull, lognormal, and generalized gamma models with and without censoring; nonparametric methods; Cox relative-risk regression with stratification and time-dependent covariates. Offered fall semesters of odd years. Prerequisite: 22S:153 and 22S:154.

63:262 Analysis of Categorical Data **3 s.h.**
Introduces concept of log-linear models as a basis for study of categorical data; includes models for discrete data, distribution theory, maximum likelihood and weighted least squares estimation for cross-classified data, tests of fit, and model selection. Offered spring semesters. Prerequisites: 22S:152 and 22S:154, or consent of instructor. Same as 22S:220.

63:264 Longitudinal Data Analysis **3 s.h.**
Introduction to statistical methodology for analyzing data from observational and experimental studies in which the response variable from each subject is measured repeatedly; topics include classical and recent parametric (normal theory) methods, extensions of generalized linear model methodology for binary and Poisson responses, logit and mean score models for repeated categorical data, nonparametric methods; emphasis on the use of statistical software packages (mainframe and PC). Offered spring semesters of odd years. Prerequisites: 22S:154 and 63:276.

63:270 Special Topics in Toxicology **2 s.h.**
Advanced topics in toxicology of faculty and student interest; may include human, animal, and environmental toxicology research methods, current issues. Offered spring semesters of even years. Prerequisite: 63:260 or 53:254 or 71:103 or consent of instructor.

63:273 Research Data Management **3 s.h.**
Students learn to manage research data, especially large databases; topics include form design, data editing, system utilities, data management computer systems, statistical packages. Offered fall semesters. Prerequisite: FORTRAN or PL/1 programming capability.

63:276 Intermediate Statistical Methods **4 s.h.**
Continuation of 63:176. Correlation, multiple linear regression, multiple factor experiments, multiple comparisons, orthogonal contrasts, analysis of covariance, life tables, rate adjustment, and analysis of odds ratios; parametric and nonparametric methods; emphasis on using computers. Offered spring semesters. Prerequisite: 63:176.

63:280 Occupational and Environmental Health Seminar **0-1 s.h.**
Contemporary topics in occupational health, agricultural and comparative medicine, and environmental health problems discussed by guest experts, faculty, and students.

63:300 Thesis **arr.**

63:411 Occupational and Agricultural Medicine **4 s.h.**
Recognition, evaluation, and treatment of occupationally related diseases; field trips to industries and farms; rotation through University clinics, labs, and offices involved in assessing occupational diseases. Open only to senior medical students. Same as 115:411.

63:998 Special Studies on Campus **arr.**
On-campus clerkship experience in using community services in primary care practice; students assigned to public health and community health agencies in this community or in the state to experience how these agencies operate in the context of the total health care service system. Open only to medical students.

63:999 Special Studies off Campus **arr.**
Off-campus rotations in various community health or preventive medicine activities; includes international assignments in developing countries, clerkships in community health programs on Indian reservations or in Appalachian or urban centers, and attachment to governmental agencies or legislative bodies. Open only to medical students.

PSYCHIATRY

Head: George Winokur
Professors: Nancy Andreasen, Remi Cadoret, William Coryell, Raymond Crowe, Eugene Gauron, Harold Mulford, Russell Noyes, Mark Stewart, George Winokur
Professors emeriti: Arthur Canter, John Clancy, Richard Jenkins, John Knott, Herbert Nelson
Associate professors: Richard Finn, Michael Garvey, Roger Kathol, Bruce Pfohl, Rafiq Waziri
Adjunct associate professor: Bruce Alexander, Arnold Sherman
Assistant professors: Brian Cook, Ghada Hamdan-Allen, Samuel Kuperman, Keith Rogers, Victor Swayze, Robert Wesner, William Yates
Associates: Les Barrickman, Anne Brewin
Clinical associate professor: Noel Brown
Clinical assistant professors: Richard Bealka, Fred Dunner, James Pullen, Paul Penningroth, Robert Smith
Adjunct professor: Paul Perry
Adjunct assistant professors: Wayne Bowers, Warren Edwards, James Marchman
Clinical instructors: Bhasher Dave, Manmohan Singh, Debra Suda, Claudia Thomas

The Department of Psychiatry teaches medical students and trains resident physicians for academic and clinical careers in psychiatry. It offers no degree program.

It instructs medical students principally during their third year, in the course of a six-week clerkship.

The department maintains a four-year training program approved by the Residency Review Committee of the American Medical Association. Training experiences are available at The University of Iowa Hospitals and Clinics and at the Iowa City Veterans Affairs Medical Center. Additional experiences are available at affiliated institutions: Broadlawns Medical Center in Des Moines, the Iowa Security Medical Facility at Oakdale, the Mid-Eastern Iowa Community Mental Health Center in Iowa City, and the Mental Health Institute at Independence.

The department offers an approved two-year residency in child psychiatry.

The department's staff is actively involved in genetic and family studies of psychiatric disorders and in research in genetic and biological psychiatry, neurochemistry, neurophysiology, and psychosocial aspects of behavior.

Many research opportunities in psychiatry are available to students and residents, and the basic science areas of neurochemistry, neurophysiology, and electrophysiology offer additional opportunities. The clinical areas of psychology, child psychiatry, and group psychotherapy also offer opportunities to a limited number of students for research and further study.

Courses

73:100 Psychiatry for Physician Assistant Students **arr.**

73:101 Psychiatry Elective for Physician Assistant Students **arr.**

73:230 Research in Psychiatry **arr.**
Special investigations in biological or psychological problems related to psychiatry. Open to medical students, graduate students, and physicians with training in scientific methodology.

73:231 Problems in Psychiatry **arr.**

Courses Open Only to Medical Students

73:5 Clinical Psychiatry **6 s.h.**
Open only to junior medical students.

73:31 General Hospital Psychiatry arr.
Psychiatric Consultation Service, The University of Iowa Hospitals and Clinics.

73:32 Introduction to Medical Psychiatry 2 s.h.
Same as 78:832.

73:33 Adult Psychiatry, Psychopathic Hospital arr.

73:34 Hospital Psychiatry, Veterans Administration Hospital, Iowa City arr.

73:35 Child Psychiatry, Psychiatric Hospital, Children's Services arr.
Roles of child psychiatry as a consultation service.

73:37 Emergency Room Psychiatry, Broadlawns Hospital, Des Moines 4, 8 s.h.

73:42 Correctional Psychiatry, Iowa Security Medical Facility, Oakdale arr.

73:105 Research Psychiatry arr.
Experience and training in practical application of scientific methodology through work with an ongoing research project at the Psychiatric Hospital or at affiliated and cooperating research centers; for senior medical students.

73:255 Psychiatric Epidemiology 3 s.h.
Survey of epidemiology of mental disorder; special problems in psychiatric epidemiology; reliability and validity; diagnostic classification; epidemiology of specific diseases including dementia, schizophrenia, manic-depression, anxiety neurosis, alcoholism, and personality disorder. Same as 63:255.

73:835 Senior Clinical Clerkship in Medical Psychiatry 4 s.h.
Same as 78:835.

73:999 Special Studies off Campus arr.

RADIATION BIOLOGY

Director: James W. Osborne
Professors: Frank Hsieh-Fu Cheng, Richard L. DeGowin, James C. Ehrhardt, David H. Hussey, Larry W. Oberley, James W. Osborne
Professor emeritus: Edgar F. Riley, Jr.
Associate professor: H. Gregg Claycamp
Graduate degrees offered: M.S., Ph.D. in Radiation Biology

The radiation biology program provides in-depth training and research experience in the study of the physical, chemical, and biological effects of radiation and the theory and widespread application of radioisotope methodology. It also stresses the importance of these areas to scientific research, clinical medicine, and the general public.

Undergraduate Study

Two courses, 77:103 Introduction to Radionuclides and Radiobiology and 77:106 Environmental and Radiological Health Physics, are open to undergraduate students in liberal arts or professional colleges. 77:103 is especially appropriate for students who want an overview of radiation's biological effects and its uses in our society. These courses also are of interest to students who plan to enter medicine, nuclear medicine technology, environmental health, or similar programs.

Graduate Programs

The M.S. program in radiation biology emphasizes technical aspects and serves well as a minor field for students whose major interest is in a related field.

The Ph.D. program is open to graduate students with a background in physics, chemistry, mathematics, biology, health sciences, veterinary medicine, or engineering. Ordinarily, the M.S. in this or a related field is required for admission to the Ph.D. program, but consideration is given to other methods of qualifying.

After completing the introductory course, students may emphasize a particular aspect of the field. The details of the program are built around previous training, interests, abilities, and career objectives. Some students elect to emphasize training in physical aspects, such as radiological physics or health physics; others major in biological aspects. In either case a broad base, rather than complete specialization, is the goal.

In addition to formal lectures, radiation biology programs involve small-group conferences and discussions. Laboratory exercises are emphasized, and students have the opportunity to become familiar with many types of instruments and techniques. It is recommended that candidates for the Ph.D. have reading knowledge of scientific French or German and competence in biological statistics or computer programming before taking the final examination. Students must have at least one semester of experience as teaching assistants and at least one as research assistants. No registration is required and no academic credit is given for the assistantships.

Special Programs

Postdoctoral training is available by arrangement with the program chair and individual faculty members.

Facilities

The Radiation Research Laboratory has X-ray generators and other radiation sources, including a 12,000 Curie Cs-137 irradiator. Students and staff also have access to other radiation sources, such as the Co-60 gamma source and the linear accelerators in the Department of Radiology, and the Janus Reactor of the Biological, Environmental, and Medical Research Division of the Argonne National Laboratory.

The Radiation Research Laboratory has a variety of radiation detectors and counters, including gamma and liquid scintillation counters and a small animal whole-body counter.

The laboratory also has ultraviolet spectrophotometers; various types of equipment for chromatography and electrophoresis; an automatic cell counter and particle sizer; tissue culture facilities; and facilities for preparing histological sections of tissues—fixed or frozen—and autoradiographs.

Financial Aid

Graduate students are supported as research assistants from funds available through research grants and contracts, or as teaching assistants from departmental funds. Individual postdoctoral awards also may be available and are applied for jointly by the candidate and his or her faculty sponsor.

Courses

77:103 Introduction to Radionuclides and Radiobiology 4 s.h.
Characteristics and biological effects of ionizing radiations, properties and uses of radioisotopes, medical applications, biological bases for protection procedures. Offered fall semesters. Consent of instructor required.

77:106 Environmental and Radiological Health Physics 4 s.h.
Radiation hazards, control regulations, problems of design and use of radiation facilities in medical, academic, and industrial situations; exposure and dose measurements in radiation environments. Offered fall semesters of odd years. Prerequisite: 4 semester hours of physics or chemistry, or consent of instructor.

77:107 Special Topics: Advanced Undergraduates arr.
Readings and/or laboratory experience arranged with instructor; for undergraduates potentially interested in a career in the radiation sciences. Offered fall semesters. Consent of instructor required.

77:108 Special Topics: Advanced Undergraduates arr.
Readings and/or laboratory experience arranged with instructor; for undergraduates potentially interested in careers in the radiation sciences. Offered spring semesters. Consent of instructor required.

77:207 Seminar: Radiation Research 1 s.h.
Research reports by students and faculty and by speakers from outside the program. Offered only satisfactory-unsatisfactory. Offered fall semesters.

77:208 Seminar: Radiation Research 1 s.h.
Research reports by students and faculty and by speakers from outside the program. Offered only satisfactory-unsatisfactory. Offered spring semesters.

77:211 Physics of Radiobiology I 4 s.h.
Characteristics of X-ray machines, nuclear accelerators, and teletherapy devices; properties of X-rays and gamma rays and their interaction with matter; radiation exposure and depth dose measurements; radiation therapy. Offered fall semesters of even years. Prerequisite: 8 semester hours of physics or 77:106 or consent of instructor.

77:220 Human and Mammalian Radiobiology 4 s.h.
Radiation effects on organ systems in humans and other mammals; spleen and bone-marrow transplantation; agents that modify radiation response; radiation carcinogenesis. Offered spring semesters of odd years. Prerequisite: 77:103 or consent of instructor.

77:223 Cellular Radiobiology 4 s.h.
Radiation and cell growth, multiplication, differentiation, and function; modification of radiation effects; effects on immunity; cell kinetics of tumor and host tissue. Offered spring semesters of even years. Prerequisite: 77:103 or consent of instructor.

77:224 Radioisotopes in Biological Research arr.
Uses of radioisotopes in a number of biological systems; eight-week emphasis on beta assay, especially liquid scintillation counting; second eight weeks focus on assay of gamma emitters. Offered spring semesters of even years. Consent of instructor required.

77:305 Research: Radiobiology arr.

77:306 Research: Radiobiology arr.

77:307 Special Topics arr.

77:308 Special Topics arr.

77:309 Thesis arr.

77:310 Thesis arr.

RADIOLOGY

Head: Edmund A. Franken, Jr.
Professors: Robert C. Brown, Frank Cheng, Steven M. Collins, Steven H. Cornell, Richard L. DeGowin, Kenneth D. Dolan, James C. Ehrhardt, Georges Y. El-Khoury, Edmund A. Franken, Jr., David Hussey, Peter T. Kirchner, Larry W. Oberley, James W. Osborne, Richard E. Peterson, Wilbur L. Smith
Professors emeriti: Herbert L. Jackson, Howard B. Latourette, Edgar F. Riley, Jr.
Associate professors: Monzer M. Abu-Yousef, Richard D. Hichwa, Shirish Jani, Mary H. Kathol, Charles H. Lu, Karim Rezai, Yutaka Sato, James Seabold, William Stanford
Assistant professors: Thomas J. Barloon, H. Gregg Claycamp, Andrew H. Cragg, Fred Doornbos, Jeffrey R. Galvin, Maleah Grover-McKay, Donald P. Hawes, Simon C. S. Kao, Mark T. Madsen, Timothy E. Moore, Donald L. Renfrew, Tony J. Ryals, Tony P. Smith, Antonio Vigliotti, B-Chen Wen, William T. C. Yuh
Associates: Karen L. Beetham, Frank M. Behlke, William E. Erkonen, Tatsuro Fukuya, Daniel Kahn, Daniel Loes, Masaki Mori, Nobuo Nakagawa, John N. Ondeko, William J. Sickels, G. Leonard Watkins
Associate research scientist: Kevin Berbaum

The Department of Radiology teaching program is designed to meet the needs and interests of fourth-year medical students in diagnostic radiology, nuclear medicine, and radiation therapy.

Rotations through the subdivisions of diagnostic radiology—including ultrasound, magnetic resonance computerized tomography, nuclear medicine, and radiation therapy—are designed according to the student's area of interest.

Courses

74:1 Clinical Radiology arr.
Clinical rotation in diagnostic radiology and nuclear medicine techniques; aims and techniques of radiation therapy. Four weeks, June through May.

74:2 Introduction to Radiation Therapy 4 s.h.
Radiation oncology and cancer management, with emphasis on the interaction of radiation therapy, chemotherapy, and surgery; direct involvement with patient care and management under immediate faculty supervision.

74:3 Vascular and Interventional Radiology arr.
Exposure to scope of vascular and interventional radiology through work up and management of patients and performance of procedures such as angiography, angioplasty, thrombolysis, embolization, percutaneous nephrostomies, and biliary drainage.

74:5 Radiology Elective for Physician Assistant Students arr.

74:100 Independent Study in the Radiologic Sciences arr.
Didactic, clinical, or research work in a radiologic science selected by the student and arranged with radiology department faculty. Consent of instructor required.

74:101 Principles of Nuclear Medicine I 6 s.h.
Didactic and laboratory course work in radiopharmacy, patient care, radiation protection, math and statistics, radiation physics, anatomy and physiology, radiochemistry and tracer techniques, medical terminology, and computer applications. Open only to nuclear medicine technology students.

74:102 Introductory Clinical Nuclear Medicine 6 s.h.
Under direct supervision of clinical instructors, students observe and assist in preparing radiopharmaceuticals and performing routine nuclear imaging and in vitro procedures. Open only to nuclear medicine technology students.

74:103 Principles of Nuclear Medicine II 3 s.h.
Didactic and laboratory course work in nuclear medicine instrumentation, radiobiology, radioimmunoassay and immunology, administration and management, film processing, and radioimmunoassay laboratory introduction. Open only to nuclear medicine technology students.

74:104 Intermediate Clinical Nuclear Medicine 9 s.h.
Progressive responsibility in radiopharmacy, nuclear imaging, and radioimmunoassay procedures; rotations include magnetic resonance imaging and other related imaging areas. Open only to nuclear medicine technology students.

74:105 Advanced Clinical Nuclear Medicine 6 s.h.
Under general supervision, students become proficient in the performance and quality control of all radiopharmacy and nuclear medicine procedures; opportunities are available for independent study and research. Open only to nuclear medicine technology students.

74:901 Clinical Radiology in Private Practice arr.
Rotations off campus to one of several participating community hospital radiology departments; offers the opportunity to observe and participate in clinical activities. Four weeks, September through May.

74:998 Special Studies on Campus arr.
Arranged on-campus special projects in radiology. Time arranged, June through May. Prerequisite: 74:1 or 74:901.

74:999 Special Studies off Campus arr.
Arranged off-campus rotation. Time arranged, June through May.

SURGERY

Head: Robert J. Corry
Professors: Adel S. Al-Jurf, Janusz Bardach, Douglas M. Behrendt, Robert J. Corry, John D. Corson, Nelson J. Gurll, Patrick Hitchon, Peter R. Jochimsen, James W. Maher, Edward E. Mason, Arnold H. Menezes, Nicholas P. Rossi, Siroos S. Shirazi, Robert T. Soper, David Steinmuller, Luis Urdaneta, John C. VanGilder
Clinical professors: Lester R. Dragstedt II, Richard L. Lawton, John Martin, David H. Watkins
Professors emeriti: Johann L. Ehrenhaft, John A. Gius, John K. MacGregor, Louis T. Palumbo, Frank R. Peterson, Frederick D. Staab, Tom D. Throckmorton
Associate professors: Albert E. Cram, John C. Godersky, Gerald P. Kealey, Ken Kimura, Christopher M. Loftus, Wilbur L. Zike
Clinical associate professors: Romeo S. Berardi, James A. Coil, Jr., Luke C. Faber, Alfred J. Herlitzka, James M. Levitt, Samuel D. Porter, Louis D. Rodgers
Assistant professors: Kimberly S. Ephgrave, David P. Kapelanski, Timothy F. Kresowik, John H. Lammer, Jr., F. Mark Lupinetti, Amanda Metcalf, Asad R. Shamma, John L. Smith, Vincent C. Traynelis
Clinical assistant professors: Don E. Boyle, Philip R. Caropreso, Douglas B. Dorner, Charles A. Johnson, Robert L. Kollmorgan, Kenneth H. McKay, William F. Nelms, Carl M.H. Peterson, Pablo R. Recinos, Walter J. Riley, David H. Stubbs, Timothy A. Thomsen
Associates: Augustin Aguilar, Jr., Mark W. Asplund, Charles W. Carroll, Phyllis Chang, Dale A. Gerdes, Robert J. Hegeman, Linda K. Rames, Beverly J. Ringenberg
Clinical associate: Bjorn N.M.N. Overgaard
Clinical lecturer: Wendell K. Downing

Courses in surgery provide a unique combination of experience oriented toward patient care with basic surgical research designed to promote students' awareness of the place of surgery among the physician's skills. These courses are available only to medical students and qualified students in associated health sciences.

Students of surgery develop awareness of surgical therapy's place in the treatment of disease. Emphasis is placed on basic emergency techniques, traumatology, oncology, burns, gastrointestinal and biliary tract disease, endocrine disease, transplantation, plastic surgery and reconstruction, peripheral vascular surgery, thoracic and cardiovascular surgery, and neurosurgery.

A majority of the courses involve patient-centered discussions and practical exercises interspersed with operating room experience. Lectures and conferences are scheduled regularly on specific topics.

Special courses in selected topics of surgical research, independent study, and clinical experiences are available to individual fourth-year students by special arrangement with the faculty.

Faculty

Special faculty strengths are centered in the fields of pathophysiology and problems of severe burns, organ transplantation, surgical control of morbid obesity, inflammatory bowel disease, biliary tract disease, pediatric surgery, and plastic surgery. The thoracic-cardiovascular and neurological surgeons have particular expertise in clinical management of the spectrum of diseases in their specialties.

Facilities

The department has more than adequate numbers of patients with a wide variety of surgical diseases for teaching. Special areas include the only burn unit of its kind in the state, providing adequate patient material for both clinical and basic science research.

Laboratories provide equipment, space, and technical expertise to support teaching and a wide spectrum of clinical and scientific research. These laboratories include animal surgery, tissue culture, gastroenterology, microbiology, peripheral vascular surgery, transplantation, organ preservation, cardiovascular surgery, neurosurgery, and oncology.

Courses

75:5 Clinical Surgery 6 s.h.
Six-week course in which students become active members of surgical teams to work on wards, in clinics, and in the operating room and help with elective and emergency care.

75:100 Emergency Room Elective for Physician Assistant Students arr.

75:110 Surgery Elective for Physician Assistant Students arr.

75:111 Surgery Elective (Transplant/Organ Retrieval) for Physician Assistant Students arr.
Extensive experience in the care of the patient with end-stage organ failure; participation in the evaluation of potential transplant candidates and in surgical procedures of the UI transplant service.

75:112 Surgery Elective (Burn Unit) for Physician Assistant Students arr.
Burn care on the unit and in the operating room; burn debridement, grafting techniques, skin storage techniques, dressing changes and tub baths, and physical therapy procedures.

75:216 Advanced Clinical Surgery 4 s.h.
Advanced responsibility for patient care on wards and in operating rooms on one of the surgical services. Consent of instructor required. Prerequisite: 75:5.

75:217 Advanced Surgical Externship arr.
Experience at a teaching center outside the University. Consent of instructor required. Prerequisite: 75:5.

75:218 Veterans Administration Medical Center Surgical Intensive Care arr.
Four- to six-week experience assessing and managing seriously or critically ill patients from general surgery; full range of subspecialties. Consent of instructor required. Prerequisite: 75:5.

75:219 Surgical Oncology arr.
Intensive experience in diagnosis and operative management of tumors; cancer chemotherapy, including infusion and perfusion techniques; breast and lymphoma conferences. Consent of instructor required. Prerequisite: 75:5.

75:221 Emergency Room on Campus arr.
Preceptorship with house officers and faculty, with emphasis on principles of acute medicine; students perform under close supervision of house officer or staff physician responsible for the emergency service; student evaluation based on performance in the emergency room.

75:222 Emergency Room off Campus arr.
Preceptorship with house officers and faculty, with emphasis on principles of acute medicine; students perform under close supervision of the house officer or staff physician responsible for the emergency service; student evaluation based on performance in the emergency room. May be elected at one of several affiliated hospitals.

75:223 Burn Therapy arr.
Students become members of burn team on ward and in operating room; experience emphasizes resuscitation with fluid and electrolytes, nutritional support, wound healing, and rehabilitation. Consent of instructor required. Prerequisite: 75:5.

75:224 Pediatric Surgery arr.
Intensive clinical experience involving ward, operating room, and outpatient clinics; attendance at both surgical and pediatric conferences; for students interested in pediatrics or surgery. Consent of instructor required. Prerequisite: 75:5.

75:225 Transplantation Surgery arr.
Intensive experience on renal transplant team; considerable exposure to coordinated efforts of other medical disciplines (e.g., internal medicine, urology) in daily rounds and conferences; assistance in research project expected. Consent of instructor required. Prerequisite: 75:5.

75:227 Clinical Neurosurgery arr.
Advanced clinical clerkship in neurologic diseases; emphasis on diagnosis of neurological disorders and operative therapy; students are expected to attend radiology- and neurology-related conferences. Consent of instructor required. Prerequisite: 75:5.

75:229 Research Surgery arr.
Students research, plan, and organize a project with a member of the surgical faculty and complete report at end of project; projects chosen in consultation with department head. Consent of instructor required.

75:230 Clinical Vascular Surgery arr.
Diagnosis and treatment of peripheral vascular disease; emphasis on noninvasive diagnosis of arterial and venous problems; broad range of vascular problems in the outpatient clinic as well as on the inpatient service; students spend time in the operating room, make rounds with residents, and attend conferences.

75:231 Research in Vascular Surgery arr.
Clinical- or laboratory-oriented projects supervised by research vascular fellows completing long-term research projects.

75:232 Clinical Cardiothoracic Surgery arr.
Students concentrate on cardiac or thoracic surgery; attendance at all scheduled division conferences is required; students who spend maximum time on the service are expected to assume intern responsibilities and complete a short-term research project. Consent of instructor required. Prerequisite: 75:5.

75:233 Research in Cardiothoracic Surgery arr.
Short- or long-term research project arranged with instructors; may involve clinical material or laboratory research; organization and completion of publishable manuscript. Consent of instructor required.

75:234 Externship at the VA in Des Moines arr.

75:235 General Surgery: Iowa Methodist Medical Center 4 s.h.

75:555 General Surgery for Physician Assistant Students arr.

75:999 Special Studies off Campus arr.

UROLOGY

Head: Richard D. Williams
Professors: Bernard Fallon, Charles E. Hawtrey, Stefan Loening, David M. Lubaroff, Richard D. Williams
Associate professor: William W. Bonney
Assistant professors: James F. Donovan, William A. See, Howard N. Winfield

In addition to the areas of urinary tract stone and infections, diagnostic urology, and results of urinary tract obstruction, urology also includes urological nephrology, urologic oncology, urologic endocrinology, and pediatric urology.

The Department of Urology of The University of Iowa College of Medicine offers courses in all these fields at undergraduate and graduate levels and in continuing education for the delivery of urologic care.

In the first year of the M.D. program, the department participates with several of the basic science departments in teaching how urology relates to the basic sciences. The department participates with the Department of Microbiology in teaching and research in immunology as it relates to transplantation and cancer.

The Department of Urology participates actively in 50:111 Introduction to Clinical Medicine, which involves the entire second semester of second-year medicine. The department offers illustrative lectures and demonstrations concerning the diagnosis and treatment of diseases involving the genitourinary tract in the male and the urinary tract in the female and child.

In the third and fourth years of the curriculum in medicine, the department offers courses in diagnostic urology, urological oncology, and the entire field of urology. In the required third-year clerkship, the department offers the basics of this material, and in the fourth year it offers advanced elective courses of intensive study in these areas.

The department offers continuing education throughout the year for urologic and family practitioners. These activities are conducted by the senior staff, whose interests include pediatric urology, reproductive physiology, urologic oncology, urinary tract stone, and prostatic diseases.

The department has earned international recognition for its studies of prostatic diseases.

The urological laboratories conduct research and offer instruction in experimental oncology and cellular immunology.

Courses

79:104 Clinical Urology 2 s.h.
Intensive two-week course in urology unit and clinic; junior medical students responsible for patient care under supervision of residents; departmental collaboration in lecture series by faculty members.

79:108 Advanced Clerkship in Urology 4 s.h.
Students become integral members of urological staff, spending full time in the department for four weeks as junior resident-level team members under the direction of junior and senior staff.

79:109 Advanced Clerkship in Pediatric Urology 4 s.h.
In-depth study of selected topics in pediatric urology; under direction of the senior urology resident, students are expected to function in the evaluation and pre-, post-, and intraoperative management of pediatric urology patients.

79:110 Individual Study and Research arr.
Individual projects, either preclinical or clinical, constructed by class member, urological senior staff, and where applicable, a member of another clinical department or preclinical department; usually culminates in a research presentation and, when appropriate, collaboration on a publication.

79:115 Urological Oncology arr.
Intensive clinical experience in diagnosis and management of all types of genitourinary neoplasms; participation in department's current oncology protocols; may culminate in written or oral presentation or collaboration on a publication.

79:116 Male Endocrinology and Reproduction arr.
Current status of male endocrinology, laboratory methods of measuring essential parameters, assessment and management of clinical problems; time devoted to evaluation of male infertility problems.

79:119 Urodynamics 4 s.h.
Clinical experience in voiding dysfunction, incontinence, and urodynamics; full participation in all aspects of patient evaluation and in urodynamic laboratory activities.

79:120 Urology Elective for Physician Assistant Students arr.

79:998 Special Studies on Campus arr.
Individually arranged by student with the approval of the department.

College of Nursing

Practicing resuscitation on a mannequin in the nursing technology lab

Dean: Geraldene Felton
Dean emerita: Myrtle Aydelotte
Assistant dean, undergraduate studies and community affairs: Eleanor McClelland
Assistant dean, clinical practice: Sally Mathis
Director, continuing nursing education: Kathleen Kelly
Director, nursing research development and utilization: Toni Tripp-Reimer
Director, student services: Carol Gruber
Professors: Kathleen Buckwalter, Geraldene Felton, Joanne McCloskey, Toni Tripp-Reimer, Barbara Thomas
Professors emeritae: Myrtle Aydelotte, Eva Erickson, Rosemary McKeighen, Hope Solomons
Associate professors: Toni Clow, Martha Craft, M. Patricia Donahue, Joann Eland, Rita Frantz, Mildred Freel, Rose Marie Friedrich, Laura Hart, Robert Kus, Jean Lakin, Meridean Maas, Leslie Marshall, Eleanor McClelland, Sandra Powell, Jean Reese, Elizabeth Swanson
Associate professors emeritae: Gladys Benz, Geraldine Busse, Phyllis Franck, Marjorie Gould, Nancy Jordison, Marjorie Lyford, Anna E. Overland, Etta H. Rasmussen
Assistant professors: Mary Blegen, Gloria Bulechek, Martha Carpenter, Carolyn Crowell, Connie Delaney, Janice Denehy, Michele Eliason, Diane Gardner, Orpha Glick, Mary Hardy, Keela Herr, Marion Johnson, Kathleen Kelly, Louise Kruse, Sonja Lively, Frances Milde, Paula Mobily, Joyce Roberson, Lavonne Ruther, Beverly Saboe, Annette Scheffel, Mary Stewart-Dedmon, Kay Weiler
Assistant professors emeritae: Joella Antes, Merle Heick, Mary Rock
Lecturers: Larry Anna Afifi, Rojann Alpers, Sandra Bellinger, Sandra Bergquist, Teresa Boese, Joni Bosch, Patricia Clinton, Perle Slavik Cowen, Kennith Culp, Linda Eastman, Karen Griffith, Vicky Hertig, Jean Huss, Deborah Jensen, Lisa Skemp Kelley, Jane Knipper, Nicollet Markovetz, Jone McDonald, Sheryl Miller, Judy Payne, Carla Randall, Margaret Rankin, Julia Smith, Joanne Tigges, Elizabeth Weitzel, Pamela Willard, Janet Williams, Susan Wilson, Mary Wiltse, June Yang, Karin Zuehls
Undergraduate degree offered: B.S.N.
Graduate degrees offered: M.A., Ph.D. in Nursing

The College of Nursing is an integral part of The University of Iowa Health Center, sharing in and contributing to teaching, research, and patient care resources that have earned international recognition. The University health center provides an unusually fine setting for nursing preparation, because the educational and clinical resources that are needed to educate nurses are available on or near the campus. Faculty and students participate fully in University life and contribute their time, interest, and abilities to the many general and special activities of a major research university.

Both the baccalaureate and master's degree programs of the college are accredited by the Department of Baccalaureate and Higher Degree Programs of the National League for Nursing, the professional accrediting agency for college and university programs of nursing education. The baccalaureate program is approved by the Iowa Board of Nursing, and graduates of the program qualify to take the licensure examination required for practice as registered nurses.

Undergraduate Program

The Baccalaureate of Science in Nursing (B.S.N.) at The University of Iowa is designed to provide preparation for careers in the hospital care of patients and in community agencies such as public health services, schools, homes, and industries. It also serves as the base for graduate study in nursing.

In addition to the advantages of combining general education with specialized career preparation, a college or university program offers the advantages of full participation in the social, cultural, and recreational activities of a highly diverse campus community. In nursing, no less than in other pursuits, a college or university background enables people not only to be prepared for a career, but to be able to achieve a life of thought and action informed by knowledge, introspection, and contemplation.

The program prepares professional nurses to be primary health care providers who are able to engage in a broad range of health promotion and teaching activities and to coordinate care in any sector of the health care system.

The nursing major provides a basis for nurses' roles in wellness and health promotion, in acute care, and in long-term care for chronic illness. The professional nurse provides care to individuals, families, groups, and communities along a continuum of health, illness, and disability.

In addition to providing care, the nurse serves as a coordinator of health care by organizing and facilitating the delivery of comprehensive, efficient, and appropriate service to individuals, families, groups, and communities. The nurse demonstrates ability to conceptualize the total continuing health needs of the patient, including legal and ethnical aspects of care. The University of Iowa program's goal is to produce graduates who are competent, committed, creative, and compassionate.

The 128-semester-hour course of study consists of 75 semester hours of liberal arts General Education Requirement courses and supportive prenursing courses, and 53 semester hours of course work in the nursing major. Students can expect to complete the program in four or four and one-half academic years. An R.N.-B.S.N. progression option is available for diploma and ADN registered nurses who wish to complete the B.S.N. For these students, a one-year plan of study is available for the completion of required nursing courses upon satisfaction of all required prerequisite courses, challenge examinations, and admission to the College of Nursing.

Nursing courses are based on the concepts of health, deviations from health, and nursing intervention and are presented at progressive levels of complexity from the sophomore through the senior year. The curriculum reflects the current trend in health care delivery toward emphasis on nursing as a service provided both inside and outside hospitals. Students have clinical experiences that are selected from more than sixty agencies in the state. Basic baccalaureate graduates are eligible to take the licensure examination required for practice as a registered nurse.

Approaches to the College of Nursing

Students may complete their entire program at Iowa, enrolling during their first year in the College of Liberal Arts. Or they may transfer from an institution that offers a two-year sequence of specific courses approved by the UI College of Nursing.

Cooperating state institutions and independent colleges that participate in the transfer plan include Iowa State University and the University of Northern Iowa; Upper Iowa University; Briar Cliff, Morningside, Loras, Luther, Clarke, Simpson, and Wartburg colleges. Participating community colleges are located in Ottumwa, Mason City, Marshalltown, Muscatine, Clinton, Iowa Falls, Ankeny, Boone, and Fort Dodge.

Completion of the transfer sequence at a cooperating institution does not guarantee admission to the College of Nursing; admission standards for transfers are the same as for all other College of Nursing applicants. Prospective transfer students who want more information about this plan should contact the cooperating institution of their choice.

Cooperative Education Summer Clinical Internship

High-achieving undergraduates have the opportunity to develop clinical skills through placement in a summer employment setting. Internships are available in hospitals, community health settings, and occupational health services in Iowa and surrounding states. This program affords undergraduates the opportunity to work closely with a preceptor while being employed, and with a faculty member in pre- and post-internship seminars.

Internships are available to qualified undergraduate students who have completed three semesters of clinical nursing courses and have maintained a nursing grade-point average of 3.00 or higher. Interested students should contact the College of Nursing coordinator of the Cooperative Education Summer Clinical Nursing Internship Program, or the Office of Cooperative Education, for specific information about the program.

Aging Studies

Students in the College of Nursing may participate in the Aging Studies Program, which is designed to provide undergraduate students a multidisciplinary approach to gerontology. Students plan their course of study with their academic adviser in close cooperation with the Aging Studies Program coordinator. Nursing students who successfully complete 18 semester hours of acceptable course work in aging studies are awarded a certificate of completion by the University registrar. Nursing students also have the option of completing a minor in aging studies by taking 15 semester hours outside of the major in courses approved by the program. For further information, see "Aging Studies Program" in the "College of Liberal Arts" section of the *Catalog*.

Honors Program

The University of Iowa College of Nursing Baccalaureate Honors Program provides seminars and independent study experience for qualified students. To be eligible, students must have completed the first clinical nursing course and must maintain a cumulative grade-point average of at least 3.25 and a nursing major grade-point average of 3.50. The baccalaureate nursing honors program enables students to explore subject matter based on individual interests, needs, and goals. It provides opportunities for self-initiative and intellectual and personal development, and challenges students to grow and excel. Students who fulfill the requirements of the program are eligible to graduate with honors in nursing.

Pregraduation Assessment Test

All students are encouraged to take a pregraduation assessment test during the final semester of their senior year. The test is designed to assess nursing students' essential nursing knowledge and application in various clinical situations; identify students' specific strengths and weaknesses, providing a sense of direction for further study and a means for setting

priorities; and help students choose effective and efficient plans for further study and review before they take the National Council on Licensure Examination for Registered Nurses.

The examination score is not computed in the course grade. Students receive a detailed printout of the results of their examination and are given recommendations for self-directed study.

Registered Nurses

The R.N.-B.S.N. progression program offers registered nurses the opportunity to build on their nursing knowledge and experience base. The nursing major sequence is designed specifically for registered nurses, with a focus on nursing process and health assessment; community health care clinical settings; leadership, management, and research opportunities; nursing professionalism; and computer expertise. Each R.N.-B.S.N. student is assigned to a College of Nursing faculty member for continued academic advising and curriculum planning.

Students may transfer previous course work completed at a college or university to satisfy some prerequisites to the nursing major. They may complete the balance of prerequisites at The University of Iowa and at many other colleges and universities in Iowa. In addition, they may take specific challenge examinations.

Once prerequisites are met, students may complete the R.N.-B.S.N. nursing major sequence in one calendar year or three semesters in a sequence that includes three clinical and two nonclinical nursing courses. R.N.'s may study on campus and in designated satellite sites. Registered nurses planning to enter the baccalaureate program should obtain special information and advice from the College of Nursing.

Faculty Advisers

Advisers from the Undergraduate Academic Advising Center advise prenursing students. After admission to the College of Nursing, each student is assigned a College of Nursing faculty adviser.

Student Organizations

College of Nursing students have their own Association of Nursing Students (ANS) and also are eligible for membership in the state and national associations of nursing students. ANS provides opportunities for professional growth and development in nursing. Its representatives are members of the Collegiate Activities Council at The University of Iowa and there is an ANS representative on the Academic Council of the College of Nursing.

Expenses

Students pay the general University fees throughout the program. They also must purchase uniforms, white shoes, a stethoscope, a watch with a full-sweep second hand, and supplies and materials for required nursing courses. Students arrange for their own health screening requirements, professional liability insurance, and transportation once they are enrolled in clinical nursing courses.

Professional Liability Insurance

All students in the College of Nursing are required to carry professional liability insurance throughout the duration of their program. Hospital agencies in which students are involved in clinical practicums require that students have insurance coverage. Entering students in the College of Nursing are provided information about this requirement and must show verification that they have purchased and currently hold professional liability insurance.

Financial Aid

In addition to general assistance available to University students, there are assistance programs specifically for nursing students. Information about financial assistance is available from the University Office of Student Financial Aid.

Admission

High School Background

The College of Nursing strongly recommends four years of English, three years of social science, three years of mathematics, two years of one foreign language, and one year each of biology, chemistry, and physics, plus other college preparatory courses selected with the help of the high school counselor.

College Background

Admission Requirements

To apply for admission to the undergraduate program in nursing, each student must be admissible to The University of Iowa and present:

A minimum of 28 semester hours completed in an accredited college;

Successful completion of seven of the fourteen prerequisites to the first clinical nursing course, including successful completion of three of the following science courses: inorganic chemistry, organic biochemistry, animal biology, microbiology, human anatomy, human physiology; and

A minimum grade-point average of 2.20 on a 4.00 scale.

Preclinical Background

Students must satisfy the following requirements, in addition to the biological science courses required for admission to the college, before beginning clinical nursing course work.

- Rhetoric—8 semester hours (may be satisfied by testing for advanced standing); a student who has earned 6 semester hours of credit in English composition may complete the speech component after admission.
- Mathematics—three years of high school math or a score greater than or equal to 26 on the mathematics battery of the ACT, or completion of a college course in mathematics comparable to or more advanced than intermediate algebra (22M:2).
- Physics—one-half year of high school physics or equivalent; if physics is completed at the college level, it may be included in the 28 semester hours required for admission.
- The following course work:

Inorganic chemistry	3 s.h.
Organic biochemistry	3 s.h.
Animal biology	4 s.h.
Microbiology	4 s.h.
Human anatomy	4 s.h.
Human physiology	4 s.h.
Nutrition	3 s.h.
Psychology	3 s.h.
Sociology	3 s.h.
Anthropology	3 s.h.
Human development and behavior	3 s.h.

Standards

To be considered for admission to the College of Nursing, the applicant must have satisfactorily completed all college course work taken.

American College Tests

All applicants for admission to The University of Iowa must complete the American College Tests. For information on the tests, write to the American College Testing Program, Box 451, Iowa City, Iowa 52243.

Selection Factors

Fulfillment of minimum admission requirements does not guarantee admission to the College of Nursing. Applications are processed as they are received. From applicants who meet minimum requirements, the college's admission committee selects those who appear to be best qualified. The committee may require personal interviews. A physical examination report and specific health screening requirements must be on file at Student Health Service ten days prior to the opening of classes for the first clinical nursing course.

Application Deadlines

Applications must be received by May 1 for the fall semester and December 1 for the spring semester.

Graduate Programs

Master of Arts

The University of Iowa M.A. program in nursing is accredited by the National League for Nursing (NLN). The curriculum is designed to build on general and professional baccalaureate study in which nursing is an upper-division offering. For this reason, graduation from an NLN-approved baccalaureate degree program is one of the admission requirements.

The curriculum consists of a core component and areas of specialization and role preparation enhanced by supporting course work in a related discipline. Forty-two semester hours are required for graduation.

Core courses are taken by all students in the program. Students select an area of nursing specialization in child health nursing, adult health nursing, family/community health nursing, or gerontological nursing, and a role preparation area in clinical specialization, administration, or teaching. Students may choose a pediatric nurse practitioner option in the child health specialization area or a nurse manager option in the nursing administration role preparation area. An M.B.A./M.A. in nursing is available.

Three supporting courses related to either the nursing specialization or role preparation areas are taken in the social, behavioral, or biological sciences or in business administration, law, or hospital and health administration.

The following courses are required for the nurse manager option:

96:200-201 Conceptual and Theoretical Foundations for Nursing I-II	5 s.h.
96:204 Leadership in Nursing: Theory and Application	4 s.h.
96:206 Professional Seminar: Issues in Nursing	2 s.h.
96:210-211 Methods of Research in Nursing I-II	6 s.h.
96:260-261 Nursing Administration: Process, Roles, and Strategies	6 s.h.
96:262 Nursing Administration Seminar	2 s.h.
96:263 Computer Applications for Advanced Administration Roles in Nursing	3 s.h.
Electives in business or hospital and health administration (96:182 is optional).	9-12 s.h.
Thesis	5 s.h.
or	
Master's Project	2 s.h.

Degree Requirements

The curriculum ordinarily requires four semesters of full-time study for completion. Part-time and evening study options are available. The M.B.A./M.A. in nursing program requires a minimum of six semesters of full-time study. Students must maintain a 2.50 minimum grade-point average and must successfully complete a master's thesis or master's project.

The master's degree curriculum consists of five components.

Advanced Nursing Core

The core consists of 17 semester hours of course work in conceptual and theoretical foundations for nursing (5 semester hours), leadership in nursing (4 semester hours), methods of nursing research (6 semester hours), and a professional issues seminar (2 semester hours).

Nursing Specialization

The specialization requires 8 semester hours of course work; it allows students to build a special area of knowledge and practice that extends beyond the advanced nursing core. Specialization may be in the broad areas of child health nursing, adult health nursing, gerontological nursing, or community/family health nursing. Students may develop their areas of specialization through their choices of course work and fieldwork experiences. For example, students who select adult health nursing as their area of specialization may choose experiences with patients in a long-term care facility, a mental health clinic, or a cardiac care unit. Students with unique career goals have the option of further modifying their plans of study under the direction of their academic advisers.

Role Development

Students may select administration, advanced clinical practice, or education as a role preparation area. A total of 6 semester hours must be earned in two courses, each with a practicum, are offered in these role areas through the College of Nursing. Students who elect to develop skills for careers in clinical practice, for example, enroll for 6 semester hours of advanced clinical practice in addition to courses required for the nursing specialization component. Students may select particular settings and/or preceptors compatible with their own career goals in fulfilling the practicum requirements of these courses.

Supporting Courses

Requires 6-9 semester hours; students may choose their supporting course work in areas related to their nursing specialization or role preparation interests.

Thesis/Master's Project

All master's degree students at the University must take a final examination. Students in the College of Nursing satisfy this requirement by completing either a thesis or a master's project. Each student, with his or her adviser, selects the option that best maximizes the student's identified career objectives.

The thesis is a systematic inquiry into a nursing problem. Methodologies may include historical research, case studies, analytical literature review, surveys, or experimental studies that meet the requirements of the Graduate College. Students earn a total of 5 semester hours of credit for the thesis.

The master's project should not replicate a previous course assignment but should be an indepth synthesis and analysis of a chosen topic. Students earn a total of 2 semester hours of credit for the master's project.

Plan of Study

The plan of study described below is designed for full-time students. Those who want to study on a part-time basis progress through courses in approximately the same way, but over a longer period of time. Taking one or two courses per semester, for example, extends the time of study to three to five years. Any course work taken ten years or more prior to the final examination must be updated, according to University policy.

First Year

Fall Semester

96:200 Conceptual and Theoretical Foundations for Nursing I	3 s.h.
96:204 Leadership in Nursing: Theory and Application	4 s.h.
Supporting course	3 s.h.
Total	10 s.h.

Spring Semester

96:201 Conceptual and Theoretical Foundations for Nursing II	2 s.h.
96:222 Nursing of Children: Health Promotion	4 s.h.
or	
96:226 Nursing of Adults: Health Promotion	4 s.h.
or	
96:231 Gerontological Nursing II	4 s.h.
or	
96:234 Community/Family Health Nursing: Health Promotion	4 s.h.
96:210 Methods of Research in Nursing I	3 s.h.
Supporting course	3 s.h.
Total	12 s.h.

Second Year

Fall Semester

96:211 Methods of Research in Nursing II	3 s.h.
96:223 Nursing of Children: Responses to Illness	4 s.h.
or	
96:227 Nursing of Adults: Responses to Illness	4 s.h.
or	
96:230 Gerontological Nursing I	4 s.h.
or	
96:235 Community/Family Nursing: Client Responses to Illness	4 s.h.
96:246 Curriculum Development in Nursing Education	3 s.h.
96:260 Nursing Administration: Process, Roles, and Strategies	3 s.h.
or	

96:268 Advanced Clinical Practice I	3 s.h.
96:299 Thesis	2 s.h.
Total	12 s.h.

Spring Semester

96:206 Professional Seminar: Issues in Nursing	2 s.h.
96:247 Nursing Education: Process, Roles, and Strategies	3 s.h.
or	
96:261 Nursing Administration: Process, Roles, and Strategies II	3 s.h.
or	
96:269 Advanced Clinical Practice II	3 s.h.
Supporting course	3 s.h.
96:298 Master's Project	2 s.h.
or	
96:299 Thesis	3 s.h.
Total	11 s.h.

Joint Master's Program with Business Administration

A joint M.B.A./M.A. in nursing is available. The program is designed for students with previous clinical and administrative experience. Applicants to this program need to be accepted for graduate study in both programs. The joint program requires a total of 69 semester hours. For more information contact the Office of Student Services.

Admission

Students should seek admission to the master's program in nursing through direct application to The University of Iowa Graduate College.

Minimum requirements for admission to the Graduate College are a completed application; official transcripts from other institutions attended; Graduate Record Examination (GRE) General Test scores; a minimum score of 530 on the Test of English as a Foreign Language (TOEFL), when appropriate; and a 2.50 minimum grade-point average for regular admission or 2.30 for conditional admission.

In addition to the general requirements for admission to the Graduate College, the College of Nursing requires that the applicant:

- Possess a bachelor's degree with a major in nursing from a program accredited by the National League for Nursing;
- Fulfill the legal requirements for the practice of nursing in Iowa;
- Have an undergraduate grade-point average of at least 2.70 or a demonstrated ability to do graduate work for regular admission, or have at least a 2.50 undergraduate grade-point average for conditional admission;
- Have current written recommendations from three persons familiar with the applicant's competence in the practice of nursing and potential for leadership and scholarship; and
- Have successfully completed a graduate level (or equivalent) statistics course prior to admission.

Applications for admission to the master's degree program are reviewed on a continuing basis. For review, the applicant's file must be complete, with all relevant materials submitted. Deadline for summer and fall admission is May 1. The spring semester admission deadline is December 1. Initial course enrollment may begin any term.

All regulations of the Graduate College pertaining to academic standing, probation, and dismissal are applicable to graduate students in nursing. Transfer credits applicable to the master's degree program are limited and must be approved by the dean for the graduate program in nursing and by the student's adviser.

Doctor of Philosophy

The Ph.D. in Nursing program prepares scientists to conduct research in nursing, extends the knowledge base relevant to nursing, and contributes to the body of knowledge in the discipline of nursing. Study requires expertise in clinical nursing and competence in research that relates to the practice of nursing and the delivery of health care.

The curriculum has two focal areas from which students choose: nursing in aging and nursing service administration. Graduates of the program aspire to careers as researchers, college and university faculty members, consultants, and as leaders in the nursing profession, in health policy-making agencies, and in health care delivery systems.

Degree Requirements

Ph.D. students must take the following nursing course work, for a total of 30 semester hours.

96:300 Classics in the Social Evolution of Modern American Nursing	3 s.h.
96:340-341 Nursing Theory Construction I and II	6 s.h.
96:310 Nursing and Health Information Systems	3 s.h.
96:320 Economics of Health Care and Nursing	3 s.h.
96:330 Nursing's Role in Health Care Policy	3 s.h.

Students who choose the aging focus take these advanced nursing seminars and practicums:

96:410 Nursing Research of Biological Phenomena and Interventions for the Elderly	3 s.h.
96:420 Geriatric Mental Health Research	3 s.h.
96:430 Nursing Research in Sociocultural Phenomena and Interventions for the Elderly	3 s.h.
96:440 Research Utilization Residency in Care of the Elderly	3 s.h.

Students who choose the nursing administration focus take these advanced nursing seminars and practicums:

96:450 Research Seminar in Nursing Administration I: Organizational Systems Concepts	3 s.h.
96:451 Research Seminar in Nursing Administration II: Health Care System Concepts	3 s.h.
96:460 Innovations in Nursing Management	3 s.h.
96:480 Residency in Nursing Service Administration	3 s.h.

Other Ph.D. requirements include the following:

Cognate minor courses	9 s.h.
Cognate research sequence: research methods and statistics	9 s.h.
96:490-491 Research Practicums	0 s.h.
Written comprehensive examination	
Dissertation:	12 s.h.

- Research seminar
- Dissertation prospectus
- Dissertation
- Oral defense

Admission Requirements

Students applying to the Ph.D. program must fulfill the following requirements:

- Completion of an NLN-accredited basic nursing program;
- Completion of a master's degree program;
- Current R.N. licensure to practice nursing;
- GRE General Test, preferably within the past five years;
- For students whose first language is not English, a minimum score of 530 on the Test of English as a Foreign Language (TOEFL);
- A minimum of one graduate-level, 3-semester-hour course in research and inferential statistics;
- A two- to three-page statement describing educational objectives and identifying a focal area for doctoral study;
- Three recommendations from professionals in the field; and
- A current curriculum vitae.

One year of nursing experience is preferred.

Professional Improvement

Some registered nurses may wish to take course work at the University to fulfill the objective of professional or personal improvement. Such individuals may request admission in the professional improvement category. This admission status allows students to take some graduate courses at the University without commitment to a degree objective.

Admission as a nursing professional improvement student requires a formal application, including submission of three current written recommendations and all academic transcripts. GRE General Test scores must be submitted to fulfill the University requirement before the end of

first semester registration. Deadlines are July 15 for admission in the fall semester, December 1 for admission in the spring semester, and May 1 for admission in the summer session.

Since acceptance as a professional improvement student has no direct bearing on acceptance as a master's or doctoral candidate, professional improvement students are required to follow the application procedure described in the preceding section if they want to seek admission as master's or doctoral degree candidates. Only 3 semester hours, or one required nursing core course, taken under professional improvement status may be used to fulfill the M.A. requirements.

Continuing Education

Through its Office of Continuing Nursing Education, the college offers nonacademic, short-term programs for registered nurses. Programs are scheduled on campus and at community sites throughout Iowa. Self-study programs and learner-designed nursing continuing education modules also are available. Continuing education units (CEUs) are awarded for each program on the basis of one unit per 10 clock hours of instruction. Continuing Nursing Education is an Iowa Board of Nursing-approved provider number 1 and is accredited by the American Nurses' Association Board of Accreditation and the National Association of Pediatric Nurse Associates and Practitioners.

Facilities

The Nursing Building is centrally located on the University's main campus, in close proximity to the Colleges of Medicine, Pharmacy, and Dentistry and The University of Iowa Hospitals and Clinics, Bowen Science Building, and the Hardin Library for the Health Sciences.

Completed in 1971, the building consists of five floors with varied and specialized facilities. Administrative offices are located on the first floor. Faculty offices are located on every floor except the second, which is used entirely for classrooms, laboratories, and the Learning Resource Services, which includes a technology laboratory. Additional classrooms and laboratories are located throughout the building. Conference rooms, student lounges, and meeting rooms are conveniently located. Research and computer facilities in the building provide direct access to the Weeg Computing Center and to college-owned microcomputers.

Courses

Primarily for Undergraduates

96:000 Cooperative Clinical Internship **0 s.h.**
Seminar for students selected for clinical nursing internships.

96:30 Human Development and Behavior **3 s.h.**
Developmental stages of the human organism from conception through senescence; physiological, intellectual, emotional, and social factors. Prerequisite: 31:1 or 31:3.

96:90 Professional Nursing: An Overview **3 s.h.**
The practice of nursing and the values, norms, and perceptions of the discipline of nursing as a career development process; competence in computer use required.

96:120 Pathology **4 s.h.**
Introduction to common physiological and psychological disorders of humans; emphasis on changes that occur in the human organism during illness and the methods used to correct these changes. Prerequisite: completion of all courses required prior to 96:121.

96:121 Foundations of Nursing Practice **4, 8 s.h.**
Components of an effective nurse-client relationship; dimensions of health, professional nursing practice, and application of the nursing process with emphasis on assessment. R.N. students must register for 4 s.h. credit. Prerequisite for 8 s.h. credit: admission to College of Nursing. Pre- or corequisite for 8 s.h. credit: 96:90. Prerequisites for R.N. students: admission to College of Nursing, R.N. licensure in Iowa, 96:30, 96:120, and ACT/PEP exams. Pre- or corequisite for R.N. students: 96:90.

96:132 Nursing Practice in Acute Illness **8 s.h.**
Physiological and psychosocial concepts and interventions of the acutely ill hospitalized patient; provides the opportunity to practice the professional nurse role in this setting. Prerequisites: 96:90, 96:120, and 96:121.

96:133 Nursing Practice in Chronic Illness **8 s.h.**
Physiological and psychosocial concepts and interventions for individuals and families with long-term health problems; opportunity to practice the professional nurse role in long-term health care settings. Prerequisite: 96:132. Pre- or corequisite: 71:132.

96:142 Integrated Approach to Professional Nursing Practice **4 s.h.**
Synthesis of concepts presented in clinical courses 96:121, 96:132, 96:133, and 96:144; registered nurse students integrate these concepts with the clinical setting. Prerequisite: registered nurse student status.

96:144 Nursing Practice in Health Promotion **8 s.h.**
Theories and concepts of disease prevention and health promotion; opportunity to practice the professional nurse role in organizations that provide programs and services for individuals, families, groups, and communities. Prerequisites: 96:133 and 71:132.

96:145 Leadership, Management, and Research in Nursing Practice **3, 5, 8 s.h.**
Concepts, theories, and skills associated with leadership, management, research, and professional development in nursing; opportunity to apply this knowledge and skill in the practice setting; students appraise their own competence, career aspirations, and professional accountability. Prerequisite: 96:144. Prerequisite for R.N. students: 96:142.

96:146 Historical, Philosophical, and Social Foundations of Nursing **3 s.h.**
Relationship of professional values and ethics; historical and legal factors in current nursing and health care issues and trends. Prerequisite: 96:144 or consent of instructor. Pre- or corequisite for R.N. students: 96:142.

Primarily for Graduates

Courses are offered only if minimum enrollments are maintained.

96:200 Conceptual and Theoretical Foundations for Nursing I **3 s.h.**
Biological and psychological concepts and theories related to man's interaction with the environment; applications to nursing.

96:201 Conceptual and Theoretical Foundations for Nursing II **2 s.h.**
Theoretical frameworks presented in 96:200 applied to nursing practice through formulation of concepts and development of hypotheses. Prerequisite: 96:200.

96:204 Leadership in Nursing: Theory and Application **4 s.h.**
Concepts, theories, and research findings related to leadership and behavioral characteristics of groups and organizations; analysis of interactive variables and functional relationships of leadership, characteristics of leaders and followers; applications to nursing and health care situations.

96:206 Professional Seminar: Issues in Nursing **2 s.h.**
Identification, exploration, and analysis of contemporary issues.

96:210 Methods of Research in Nursing I **3 s.h.**
Development of the scientific approach to knowledge and to problem solving; relationships among theory, research, practice, and specific research approaches; methods of data collection and problems of measurement of variables synthesized through development of a research proposal. Prerequisites: graduate statistics course or equivalent, and 96:200.

96:211 Methods of Research in Nursing II **3 s.h.**
Four major topics: critiquing research proposals and reports, data analysis, communicating results and findings, and grantsmanship; critical evaluation of research proposals and reports from various perspectives; nursing research problem analysis using various computers and several statistical programs and packages; overview of grantsmanship; sources of external support for nursing research; tasks involved in applying for grants and contracts. Prerequisite: 96:210.

96:220 Concepts of Primary Health Care in Nursing **3 s.h.**
Through physiopsychosocial, life span perspective, and multidisciplinary approaches, students apply the nursing process in the delivery of primary health care to a target population; focus on development and refinement of physical assessment and data collection skills, primary health care concepts, ambulatory health care systems, and management of selected health concerns of clients. Prerequisites: 96:200, 96:121 or equivalent, and a minimum of six months' clinical experience as an R.N.

96:222 Nursing of Children: Health Promotion **4 s.h.**
Knowledge and skill expansion in assessing health, formulating nursing diagnoses relating to health, and planning, implementing, and evaluating nursing interventions designed to maintain, promote, and optimize the health of children and their families; three hours of class time and a minimum of four practicum hours per week. Prerequisite: 96:200. Pre- or corequisite: 96:210.

96:223 Nursing of Children: Responses to Illness **4 s.h.**
Knowledge and skill expansion in assessment, diagnosis, intervention, and evaluation of children's and their families' responses to illness; three hours of class time and a minimum of four practicum hours per week. Prerequisite: 96:200. Pre- or corequisite: 96:210.

96:224 Applications of Primary Health Care Concepts in Children and Adolescent **3 s.h.**
Development and refinement of knowledge and skills in health promotion and maintenance of children and adolescents in clinical settings through guidance and increased student participation and collaboration in the delivery of primary health care. Prerequisite: 96:220. Same as 70:201.

96:226 Nursing of Adults: Health Promotion **4 s.h.**
Knowledge and skill expansion in assessing health, formulating nursing diagnoses relating to health, and planning, implementing, and evaluating nursing interventions designed to maintain, promote, and optimize the health of adult clients; three hours of class time and a minimum of four practicum hours per week. Prerequisite: 96:200. Pre- or corequisite: 96:210.

96:227 Nursing of Adults: Responses to Illness **4 s.h.**
Knowledge and skill expansion in assessment, diagnosis, intervention, and evaluation of adult clients' responses to illness; three hours of class time and a minimum of four practicum hours per week. Prerequisite: 96:200. Pre- or corequisite: 96:210.

96:230 Gerontological Nursing I **4 s.h.**
Biological changes that occur with aging; pathological

changes frequently associated with the aging process; three hours of class time and a minimum of four practicum hours per week. Prerequisites: 96:200, 96:204, and 96:210.

96:231 Gerontological Nursing II **4 s.h.**
Review of complex and interactive factors that affect the mental status and psychological health of older individuals in community, clinic, acute- and long-term care settings; three hours of class time and a minimum of four practicum hours per week. Prerequisites: 96:200, 96:204, 96:210, and 96:230.

96:234 Community/Family Health Nursing: Health Promotion **4 s.h.**
Knowledge and skill expansion in assessment, diagnosis, and intervention related to individual, family, aggregate, and community health maintenance and health promotion; three hours of class time and a minimum of four practicum hours per week. Prerequisite: 96:200. Pre- or corequisite: 96:210.

96:235 Community/Family Nursing: Client Responses to Illness **4 s.h.**
Assessment, diagnosis, intervention, and evaluation of individual, family, aggregate, and community responses to illness; use of strategies that encompass the concepts of community health; three hours of class time and a minimum of four practicum hours per week. Prerequisite: 96:200. Pre- or corequisite: 96:210.

96:246 Curriculum Development in Nursing Education **3 s.h.**
Curriculum development process and major societal, educational, and professional forces affecting undergraduate curriculum development design and evaluation of curriculum components in various basic nursing education programs; two hours theoretical instruction and four hours application experience per week. Prerequisites: 96:201, 96:204, 96:210, and one nursing specialization course; or consent of instructor.

96:247 Nursing Education: Process, Roles, and Strategies **3 s.h.**
Role of the nurse educator through study and application of teaching/learning theories; seminar on process, roles, and strategies for the educator and learning tasks of students in various current nursing education programs, supplemented by student/faculty-negotiated teaching experiences; two hours theoretical instruction and four hours of application experience per week. Prerequisite: 96:246.

96:260 Nursing Administration: Process, Roles, and Strategies **2-3 s.h.**
Functions and responsibilities of the nurse administrator; emphasis on the administrative process and roles of the nursing service administrator in a hospital setting, with other organizations as class interest dictates; includes a didactic component and a weekly practicum of four hours minimum. Prerequisites: 96:201 and 96:204.

96:261 Nursing Administration: Process, Roles, and Strategies II **3 s.h.**
Analysis of the functions and responsibilities of the nurse administrator; emphasis on strategies used by the nursing service administrator in a hospital setting, with other organizations as class interest dictates; includes a didactic component and a weekly practicum of four hours minimum. Prerequisites: 96:201 and 96:204. Recommended: 96:260.

96:262 Nursing Administration Seminar **2 s.h.**
Current issues and applications in nursing and health administration; focus on emerging administrative concerns, including product-line management, information management systems, and policy concerns for the nurse administrator. Open only to students in nurse manager option. Prerequisites: 96:260 and 6 s.h. of support courses in administration. Pre- or corequisite: 96:261.

96:263 Computer Applications for Advanced Administration Roles in Nursing **3 s.h.**
Prepares nursing administration students to effectively and efficiently use computerized information for innovative decision making and strategic planning in managerial positions in nursing.

96:268 Advanced Clinical Practice I **3 s.h.**
Students analyze nurses' roles in advanced clinical practice while providing care to clients in their area of clinical interest; seminar on process, roles, and strategies for advanced clinical practice supplemented by emphasis on student/faculty-negotiated practicum experiences that facilitate role preparation; six-hour-weekly practicum. Prerequisites: 96:200, 96:201, 96:204, 96:210, and one specialization course.

96:269 Advanced Clinical Practice II **3 s.h.**
Continuation of 96:268. Prerequisites: 96:268 and two specialization courses.

96:298 Master's Project **arr.**

96:299 Thesis **arr.**

For Doctoral Candidates

96:300 Classics in the Social Evolution of Modern American Nursing **3 s.h.**
Social evolution of modern American nursing from 1870 to present; writings, classic books, and documents in the nursing discipline; influence of societal conditions on expansion of nursing services and nursing education. Open only to doctoral students.

96:310 Nursing and Health Information Systems **3 s.h.**
Seminars and field study on computers in nursing and the use of tools to assess computer resources; includes an overview of computer information systems, systems theory and analysis, and nursing applications. Open only to doctoral students.

96:320 Economics of Health Care and Nursing **3 s.h.**
Economic principles necessary to analyze issues in the economics of health care: demand and supply for health manpower, insurance issues, costs and financing of health care services, contemporary hospital structures and organization, role of the government. Open only to doctoral students.

96:330 Nursing's Role in Health Care Policy **3 s.h.**
Issues critical to maximizing the unique contributions of nursing to the health care delivery system; impact of federal health policy on nurses, nurse manpower projections, trends in hospital nursing, challenges of long-term care, frontiers of nursing practice, strategies for increasing nurses' autonomy, and federal nursing priorities. Open only to doctoral students.

96:340 Nursing Theory Construction I **3 s.h.**
Foundation for generating nursing theory for professional practice; issues in the history, philosophy, and sociology of science; development of a scientific community in nursing; relationship between theory construction and research; methods used to generate specific theories. Open only to doctoral students.

96:341 Nursing Theory Construction II **3 s.h.**
Generation, testing, and reformulation of a theory for professional practice; focus on ethical, legal, and political forces that shape and influence research and scholarship; how research and scholarship contribute to society. Open only to doctoral students.

96:410 Nursing Research of Biological Phenomena and Interventions for the Elderly **3 s.h.**
Analysis and evaluation of research specific to the functional health of elderly clients and biological processes of aging; emphasis on methodological issues and instrumentation appropriate for the study of biological phenomena. Open only to doctoral students.

96:420 Geriatric Mental Health Research **3 s.h.**
Analysis and evaluation of geriatric mental health research; emphasis on program evaluation, geriatric mental health services research, and methodological issues. Open only to doctoral students.

96:430 Nursing Research in Sociocultural Phenomena and Interventions for the Elderly **3 s.h.**
Sociocultural issues for aging clients and corresponding nursing interventions; theoretical orientations to dynamics of aging, transitions and role changes, and social/environmental issues. Open only to doctoral students.

96:440 Research Utilization Residency in Care of the Elderly **3 s.h.**
Students conduct a project in research utilization based on relevant gerontological nursing research. Prerequisites: two from 96:410, 96:420, 96:430.

96:450 Research Seminar in Nursing Administration I: Organizational Systems Concepts **3 s.h.**
Nursing administration research related to health care organization and nurses in the organization; review of data collection instruments; directions for further research and implications for model building, research methods, and practice. Open only to doctoral students.

96:451 Research Seminar in Nursing Administration II: Health Care System Concepts **3 s.h.**
Management concepts and health care factors that influence the delivery of care systems; patient outcomes; measurement of quality nursing care. Open only to doctoral students. Prerequisite: 96:450 or consent of instructor.

96:460 Innovations in Nursing Management **3 s.h.**
Current and emerging issues in nursing and health care that affect functions and responsibilities of the nurse administrator; research base for recent innovations in nursing management; delivery of care systems for high-risk populations. Open only to doctoral students.

96:480 Residency in Nursing Service Administration **3 s.h.**
Students apply knowledge and skills in administration under the guidance of a renowned nurse administrator. Open only to doctoral students.

96:490 Research Practicum **0 s.h.**
First of two supervised research practicums as a research assistant in an on-going investigative team. Consent of adviser required.

96:491 Research Practicum **0 s.h.**
Continuation of 96:490. Consent of adviser required.

96:497 Dissertation Research Seminar: Research Application and Advanced Design **0 s.h.**
Practical and philosophical problems associated with dissertation research; intense two-semester seminar concurrent with registration for doctoral dissertation hours. Open only to third-year doctoral students in nursing. Corequisite: 96:499.

96:499 Dissertation Research **arr.**

Electives

The current *Schedule of Courses* lists nursing electives being offered. Courses vary from semester to semester.

96:112 Human Sexuality **1-3 s.h.**
Physiological and psychological aspects of human sexuality; parameters defined by needs of the group. Same as 17:117, 42:112, 7C:112.

96:116 Loss and Death in Clinical Nursing Practice **3 s.h.**
Exploration of thoughts and feelings elicited in dealing with loss and death in the clinical nursing practice. Prerequisite: 96:144.

96:129 Introduction to Gerontology **2-3 s.h.**
Interdisciplinary course focusing on the concept of aging, with emphasis on theories, resources, and challenges of aging and implications for nursing practice. Open only to seniors or to others with consent of instructor.

96:130 Normative and Psychopathological Aspects of Aging **3 s.h.**
Geriatric mental health; focus on normative aspects of adult aging and psychopathological aspects of adult aging; for health profession and social and behavioral science students.

96:137 Nursing Care of the Patient in Pain **3 s.h.**
Advanced concepts in pain management; focus on assessment, pharmacological and nonpharmacological nursing intervention, and evaluation of acute, chronic-benign, and chronic-malignant pain; for undergraduate nursing students. Prerequisite: 96:132 or registered nurse status.

96:138 Alteration in Body Image: Nursing Diagnosis and Management **3 s.h.**
Nursing diagnosis as organizing framework for mechanisms of defense, adaptation, and coping; clinical experience with focus on how nurses help patients adjust to body image changes. Prerequisite: 96:132 or equivalent, or consent of instructor.

96:150 Independent Study **arr.**
Supervised study and/or clinical practice adjusted to needs of student.

96:151 Honors Independent Study **1-3 s.h.**
A project or experience related to the course objectives of a required nursing course; students are required to demonstrate proficiency at a higher level than that expected for the specific course. May be repeated once. Open only to students in nursing undergraduate honors program.

96:152 Honors Seminars **1 s.h.**
A wide range of topics relevant to nursing from the humanities and the social and biological sciences, as well as contemporary issues that affect the practice of nursing. May be repeated twice. Open only to students in nursing undergraduate honors program.

96:160 Human Structure and Function—A Cellular Approach **3 s.h.**
Prepares students to identify human tissues, cell types, and subcellular organelles; to specify their functions; and to describe processes common to normal human cells, necessary components of the immediate environment of human cells, and cellular mechanisms by which the human organism defends itself. Offered fall semesters of odd years. Prerequisite: 96:121 or consent of instructor.

96:162 Human Structure and Function—A Systemic Approach **4 s.h.**
Prepares students to describe structure, function, and organization of neural and hormonal systems of control and communication in human organism, identify relationships between functions and structures (gross and microscopic) of all organs, and describe mechanisms for regulation of organ functions. Offered fall semesters of even years. Prerequisite: 96:121 or consent of instructor.

96:165 Applied Genetics for Health Care Professionals **3 s.h.**
Genetics in health and illness; human genetic principles, their clinical application, and their application to health care policy. Pre- or corequisite: 96:144 or registered nurse status or consent of instructor.

96:172 Health and Cultural Diversity **3 s.h.**
Overview of the dynamics of health and illness in cross-cultural perspective. Offered spring semesters of even years. Prerequisites: 113:3 or 113:101 or 96:132 or consent of instructor. Same as 113:108.

96:174 Transcultural Mental Health **3 s.h.**
Survey of cross-cultural perspectives on mental health and mental illness; examination of expected behavioral patterns for different developmental ages in various cultures, as well as deviance from these patterns. Offered spring semesters of odd years. Prerequisite: 96:132 or junior standing in anthropology or consent of instructor. Same as 113:107.

96:182 Financial Management for the Nurse Manager **3 s.h.**
Basics of financial management: projecting and monitoring budgets, statistics used in formulating and supporting budgets, writing proposals using statistical and financial data.

96:183 Community Health Nursing as a Field of Practice **3 s.h.**
The field of practice in community health, from a viewpoint of public health science and nursing; concepts of epidemiology, client advocacy, prevention, and holistic health in relation to individuals, families, and aggregates; legal authority and social policy issues pertaining to community health care. Prerequisite: R.N. licensure.

96:184 Management and Supervision in Community Health Nursing **3 s.h.**
Management concepts of organization, power, change, conflict, authority, and accountability; organization, communication, financial management, and leadership theories applied to the role of manager in community health nursing; decision-making strategies incorporated in planning, implementing, and evaluating programs of care in community health nursing. Open only to R.N. license holders.

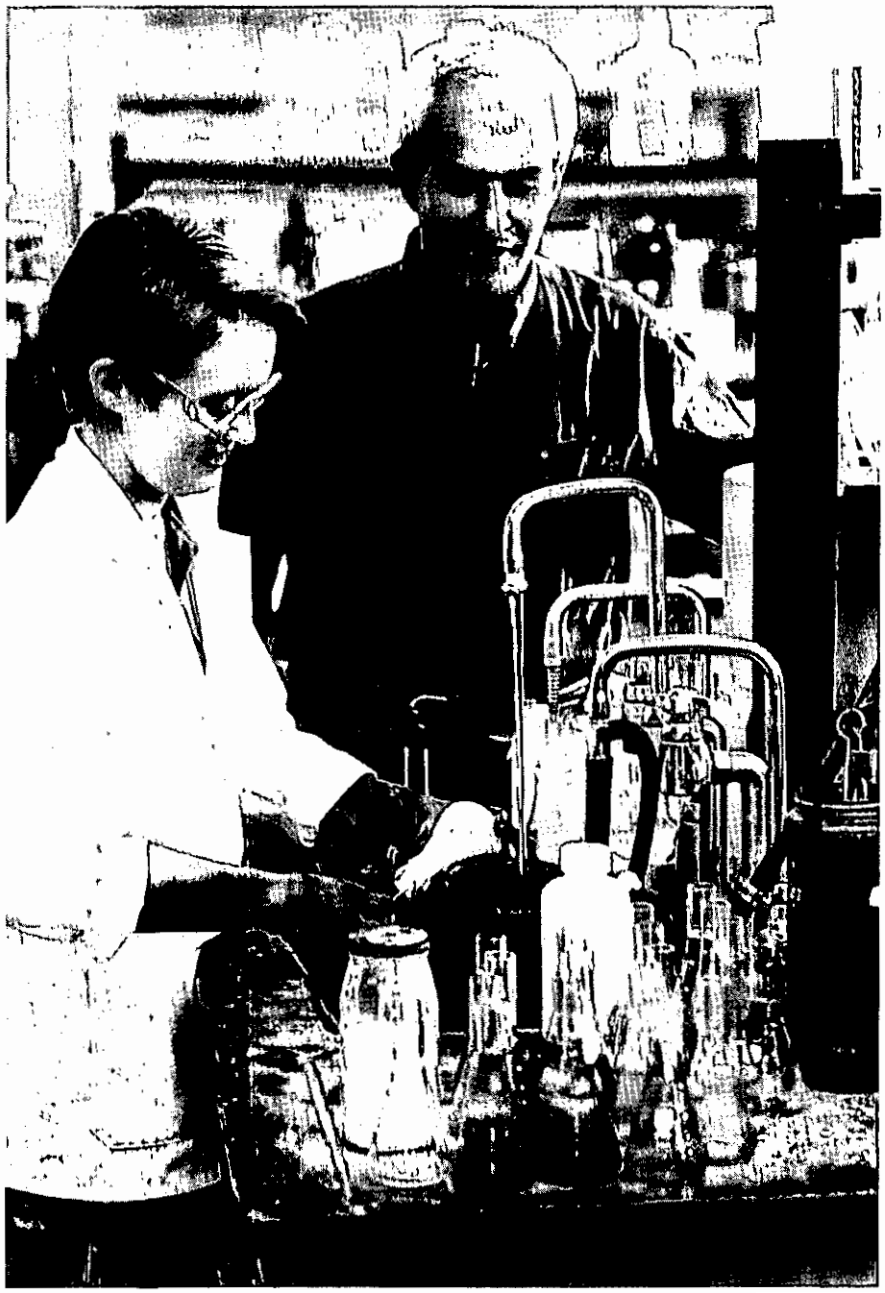
96:185 Nursing Practice in the Workplace **3 s.h.**
Scope of occupational health nursing; focus on concepts of epidemiology; health promotion, prevention of health hazards in the workplace; legal, ethical, and social issues related to the occupational environment.

96:186 Seminar in Oncology Nursing **3 s.h.**
Care of the client living with a cancer diagnosis; nursing process, expanded content of pathophysiology, and care of cancer clients in the acute and chronic phases of illness; oncologic emergencies, issues, and trends; care of the care giver; advanced concepts based on the Oncology Nursing Society standards of care. Open only to registered nurses currently practicing or experienced in the care of cancer clients, or to others with consent of instructor.

96:187 Technology and Clinical Application for Nursing **3 s.h.**
Current evolution of technology in nursing; societal and professional expectations compared to professional nursing practice; usefulness of devices evaluated in context of nursing diagnosis. Prerequisite: 96:132 or registered nurse status or consent of instructor.

96:216 Group Leadership in Human Sexuality **0-3 s.h.**
Overview of group process, with emphasis on the role of the group leader; method of teaching-didactic presentation and discussion; group experience and practice application. Same as 7C:216, 42:216.

College of Pharmacy



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Assistant dean for undergraduate affairs: David P. Carew
Acting director of pharmaceutical service: Douglas R. Flanagan medicinal chemistry-natural products: Joseph G. Cannon
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Head, pharmaceutical socioeconomics and continuing education: Bernard Sorofman
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Clinical assistant professors: C. David Butler, Ruth Ann Calloway, Jay D. Currie, Paula J. Hansen, Kathy Hauge, Sandra Johnson, James A. Karboski, Betty H. Rowland
Adjunct assistant professors: David Carlson, Pedro M. Carrillo, William Fisher, Dorothy M. Maher, David McFadden, Kevin G. Moores, Laurel M. Skaar, Jan C. Wenger, Douglas J. Zurawski
Clinical instructors: Bernard J. Cremers, Dennis A. Elbert, Mark Feldick, Randal P. McDonough
Adjunct instructors: David H. Bernhard, Carl Hensley, Warren Knarr, Alan L. Mustion, Gary Ocheltree, John M. Saur
Degrees offered: B.S.Ph.; Pharm.D.; M.S., Ph.D. in Pharmacy

The pharmaceutical sciences are concerned with preparing and dispensing medicinal products and monitoring their activity. Pharmacists, through education and training, can identify, analyze, select, combine, and standardize these medicines; determine proper dosage regimens; and serve the community as a prime source of information on health topics.

Pharmacists are basically specialists in the science of drugs. They must understand drug composition, chemical and physical properties, manufacture and uses, and activity in normal individuals as well as in ill patients, and must be familiar with tests for strength, purity, and efficacy of drug products. Pharmacists compound and dispense prescriptions written by health practitioners, who rely on pharmacists for information about the availability, activity, toxicology, and contraindications of various drugs. Pharmacists also communicate knowledge of drugs to patients and to other health professionals.

Nearly everyone is familiar with the community pharmacist and the pharmacy in which she or he practices. The size and type of practice may vary—community pharmacies may be large or small, operated by individuals or by corporations. The pharmacists who staff these pharmacies make up the majority of practitioners. More than 125,000 men and women practice in community pharmacies.

Approximately 45,000 pharmacists are employed in hospital pharmacy practice. In this setting, they work closely with other members of the health care professions. Some work in government agencies such as the U.S. Public Health Service, Veterans Administration, Food and Drug Administration, and the armed forces. Pharmacists serve as commissioned officers in the military services as well as the U.S. Public Health Service.

Many pharmacists assume administrative positions in industry, including manufacturing, research and development, control, marketing, and advertising. Many are employed in pharmaceutical sales as medical service representatives. Pharmacy training is especially valuable to these men and women, who are responsible for acquainting physicians, dentists, veterinarians, and other pharmacists with drug products. The educational background of pharmacists provides an opportunity for employment in many fields not commonly associated with pharmacy.

In the United States, more people receive total health care than ever before. This expansion of health care will continue. Young pharmacists will face new challenges, expanded responsibilities, and an ever-increasing growth in opportunities.

Undergraduate Program

Undergraduate students in pharmacy enroll in the Bachelor of Science program. They receive professional training and education in a number of areas, including pharmacy technology, biopharmaceutics, medicinal chemistry and natural products, pharmaceutical socioeconomics, and clinical and hospital pharmacy. Aspects of biotechnology are a common part of pharmacy education.

The Colleges of Liberal Arts, Business Administration, Dentistry, and Medicine contribute to the education of pharmacy students by providing instruction in the physical sciences, basic medical sciences, business, the humanities, and social sciences.

The Bachelor of Science program in pharmacy consists of one year of prepharmacy study, taken in the College of Liberal Arts at The University of Iowa or at any accredited community or liberal arts college, and four years of pharmacy studies.

It is possible to transfer into the College of Pharmacy with advanced standing after two years of college-level work at an approved institution. Students entering the college after two years of preprofessional study can complete the professional program in three years if the preprofessional study includes, in addition to the basic preprofessional requirements, at least 8 semester hours of organic chemistry, 5-8 semester hours of biology or zoology, 3-4 semester hours of quantitative analysis, and at least 15 semester hours of general education electives. Only a limited number of students are admitted with advanced standing.

The University of Iowa College of Pharmacy is accredited by the American Council on Pharmaceutical Education. Graduates of the college are qualified to take the licensure examination given by the Iowa Board of Pharmacy Examiners.

Graduation from the baccalaureate program in pharmacy requires satisfactory completion of the required courses, 24 semester hours of general education electives, and a pharmacy grade-point average and a total cumulative grade-point average of at least 2.00.

Rules and regulations concerning academic probation, pass/nonpass, credit by examination, maximum schedule, second-grade-only option, waiver or substitution of courses, cancellation of registration, drop date, and correspondence study, are provided in the "College of Pharmacy" section in the current *Schedule of Courses* and the *Handbook for Undergraduate Pharmacy Students*.

Iowa-Queensland Exchange Program

In 1988 the college inaugurated what is believed to be the first formal international exchange of undergraduate pharmacy students. Under the program, Iowa students are selected by a faculty committee to spend one year studying at the department of pharmacy of the University of Queensland, Brisbane, Australia; in turn, Queensland students spend one year at Iowa.

Iowa students travel to Brisbane beginning in the spring semester of the P2 year. In order to qualify, students must rank in the upper half of their class and must show how both they and the college would benefit from their participation in the program. The students and the college share the cost of the program.

Honors Program

The honors program gives students an opportunity to interact as part of a small group with leading professors and scientists from all areas of the University. In their P3 year, students in the upper 20 percent of their class may enroll in the Honors Seminar, a series of weekly discussions on topics from the humanities, the sciences, law, and the social sciences.

Honors students may elect to prepare a major paper or carry out a research project of limited scope during their P4 year. Satisfactory completion of the project certifies them as having completed the College of Pharmacy Honors Program, a fact that is noted on the permanent record.

Admission Requirements

The college-level course work outlined below is the minimum academic requirement for admission to the College of Pharmacy. Fulfillment of these requirements does not ensure admission to the college. The college admission committee selects the best qualified applicants. Questions concerning satisfaction of degree requirements should be directed to the chair of the undergraduate curriculum committee.

Preprofessional Course Work

Rhetoric: 8 semester hours, or 6 semester hours of transfer credit in English composition and rhetoric, and 2 semester hours in speech.

General chemistry: 8 semester hours.

Mathematics: 3 or 4 semester hours of a satisfactory differential and integral calculus course.

Physics: may be satisfied with one year of high school physics; students are encouraged to complete 29:8 Basic Physics.

General education electives: 6 semester hours. In addition to the required courses in the curriculum, each student must complete 24 semester hours of general education courses to meet graduation requirements. These elected courses should be in the behavioral, social, and humanistic areas of knowledge. Some courses in the College of Business Administration also may satisfy general education requirements.

Transfer Students

Students who transfer into the college after two years in a community or liberal arts

college may be able to complete the pharmacy program in three years if they have satisfactorily completed courses in organic chemistry, biology or zoology, and quantitative analysis, and have satisfied general education electives. Students who plan to remain in a community college for two years before transferring to The University of Iowa should consult the dean of the College of Pharmacy concerning course requirements.

The Professional Curriculum

First Year

First Semester

46:13 Pharmacy Math	3 s.h.
4:121 Organic Chemistry I	3 s.h.
37:3 Principles of Animal Biology	5 s.h.
4:101 Elementary Quantitative Analysis	4 s.h.
Total	15 s.h.

Second Semester

46:14 Pharmacy Orientation	2 s.h.
4:122 Organic Chemistry II	3 s.h.
4:141 Organic Chemistry Laboratory	3 s.h.
*60:1 Principles of Human Anatomy	3 s.h.
**General education electives	4-6 s.h.
Total	15-17 s.h.

*Also offered first semester for students on a 2-3 program only.

**In addition to the required courses in the curriculum, students must complete 24 semester hours of general education courses. These elected courses should be in the behavioral, social, and humanistic areas of knowledge.

Second Year

First Semester

46:23 Pharmaceutics I	4 s.h.
99:162 Biochemistry for Pharmacy Students	4 s.h.
61:112 Health Sciences Microbiology	4 s.h.
*60:1 Principles of Human Anatomy	3 s.h.
General education electives	0-3 s.h.
Total	15-18 s.h.

*May be taken in second semester of first year.

Second Semester

46:24 Pharmaceutics II	4 s.h.
46:22 Pharmaceutical Socioeconomics: Health Care Systems	4 s.h.
46:128 Medicinal and Natural Products Chemistry I	5 s.h.
72:150 Intermediate Physiology	4 s.h.
Total	17 s.h.

Third Year

First Semester

46:131 Medicinal and Natural Products Chemistry II	5 s.h.
69:203 Introduction to Human Pathology	4 s.h.
71:101 Pharmacology for Health Sciences: Pharmacy	5 s.h.
46:35 Pharmaceutical Socioeconomics: Practice Management	3 s.h.
Total	17 s.h.

Second Semester

46:132 Medicinal and Natural Products Chemistry III	5 s.h.
71:103 Pharmacology and Toxicology	3 s.h.
46:38 Pharmaceutics III	3 s.h.
46:110 Therapeutics I	3 s.h.
General education electives	0-3 s.h.
Total	14-17 s.h.

Fourth Year

First Semester

46:41 Jurisprudence	2 s.h.
46:43 Pharmaceutics IV	4 s.h.
46:61 Drug Information	3 s.h.
46:111 Therapeutics II	4 s.h.
General education electives	0-4 s.h.
Total	13-17 s.h.

Second Semester

46:59 Hospital Pharmacy Externship	4 s.h.
46:60 Community Pharmacy Externship	4 s.h.
*Clinical pharmacy clerkship	4 s.h.
*Clinical pharmacy clerkship	4 s.h.
Total	16 s.h.

*Two clinical clerkships are selected from a large number of clerkship offerings.

Professional Electives

46:48 Community Pharmacy Retailing	3 s.h.
46:56 Non-Prescription Drugs	2 s.h.
46:101 Pharmacy: Projects	1-3 s.h.
46:102 Pharmacy Honors Seminar	1 s.h.
46:103 Physical Pharmacy	3 s.h.
46:104 Pharmacokinetics and Biopharmaceutics	3 s.h.
46:105 Industrial Pharmacy Survey	2-3 s.h.
46:109 Computer Applications in Pharmacy	2 s.h.
46:114 Advanced Clinical Pharmacy	4 s.h.
46:135 Perspectives in MCNP Research	1 s.h.
46:147 Introduction to Research Methods	3 s.h.
46:154 Communications Skills for Pharmacists	3 s.h.

Professional Clerkships

46:80 Medicine Clerkship	4 s.h.
46:81 Family Practice Clerkship	4 s.h.
46:82 Pediatrics Clerkship	4 s.h.
46:83 Pharmacokinetics Clerkship	4 s.h.
46:84 Psychiatry Clerkship	4 s.h.
46:85 Neurology Clerkship	4 s.h.
46:86 Surgery Clerkship	4 s.h.
46:87 Clinical Nuclear Pharmacy Clerkship	4 s.h.
46:88 Dental College Clerkship	4 s.h.
46:89 Elective Clerkship	4 s.h.

Transfer with Advanced Standing

Students transferring from other colleges of pharmacy accredited by the American Council on Pharmaceutical Education may receive credit toward the Bachelor of Science degree in pharmacy for satisfactory completion of course work required in this curriculum. However, at least one academic year (30 semester hours) of residence at The University of Iowa College of Pharmacy is required for the degree.

Students transferring from nonpharmacy colleges may receive credit for work required in the Bachelor of Science curriculum in pharmacy, but still must expect to be enrolled for at least three years in the College of Pharmacy.

In accordance with University policy, students who have earned more than one-half the total semester hours required for the B.S. degree in pharmacy cannot receive further credit for courses taken at two-year institutions. Students who want to satisfy required or elective course credit at other institutions must have permission of the assistant dean for undergraduate affairs before enrolling in such courses.

A minimum grade of C is required for work applied by transfer toward the pharmacy degree.

Graduation

Graduation from the College of Pharmacy with the B.S. degree in pharmacy requires completion of all required courses plus 24 semester hours of general education electives. In order to graduate, students must earn a pharmacy and a total cumulative grade-point average of at least 2.00. The pharmacy grade-point average is computed from the grades earned in all of the specifically required courses that students have completed while enrolled in the College of Pharmacy.

Graduate Programs

The college has graduate programs in each of its four academic divisions. Master of Science and Doctor of Philosophy programs are available in pharmaceutics, medicinal and natural products chemistry, and pharmaceutical socioeconomics. A Master of Science degree is available in clinical-hospital pharmacy.

Advanced study in the pharmaceutical sciences prepares students for research, teaching, and administrative positions in the pharmaceutical industry, in colleges and universities, in government agencies, and in a number of health-related institutions and organizations.

The application deadlines, grade-point average for admission, Graduate Record Examination (GRE) Aptitude Test scores, and necessary letters of recommendation are the same as those for the Graduate College. Academic requirements for maintaining graduate registration are

determined by individual divisions of the College of Pharmacy.

Doctor of Pharmacy (Pharm.D.)

The Pharm.D. program is a two-year, postbaccalaureate professional degree program that combines didactic course work and clinical clerkship. The program is accredited by the American Council on Pharmaceutical Education. The major goal of the program is to provide the health care system with pharmacists who are specifically prepared to undertake an extended role in monitoring, evaluating, and optimizing drug therapy in hospitalized and ambulatory patients. This program is available to a limited number of highly qualified pharmacy graduates.

Prospective students may obtain specific information on the Pharm.D. program by writing to The University of Iowa, College of Pharmacy, Iowa City, Iowa 52242.

Facilities

The Pharmacy Building is located in the health center complex on the University's main campus, in close proximity to the Colleges of Medicine, Nursing, and Dentistry. The University of Iowa Hospitals and Clinics, the Bowen Science Building, and the Hardin Library for the Health Sciences also are nearby.

The building is a five-story structure designed to provide modern facilities for a comprehensive program of pharmacy education. In addition to classrooms and an auditorium, there are well-equipped separate laboratories for instruction at the undergraduate and graduate levels.

The building also houses the Learning Resource Center (LRC), with current texts and periodicals useful to undergraduate and graduate pharmacy students. The LRC has several computer terminals available to students and provides on-line computer searches for pharmacy students and faculty.

The Pharmaceutical Services Division of the college serves as a teaching unit as well as a service division. Here, undergraduate and graduate students learn methods of large-scale pharmaceutical product development and production. The division's state-of-the-art equipment and its licensure by the U.S. Food and Drug Administration make it an outstanding facility.

The Iowa Drug Information Service (IDIS) also is a service division of the college. IDIS serves as a central repository and distribution center of specialized information related to drugs and drug therapy. IDIS not only reaches subscribers throughout the world but plays an important educational role for undergraduate and graduate pharmacy students as well.

In the clinical pharmacy program, students work with other health professionals and have the opportunity to monitor drug therapy in hospitalized and nonhospitalized patients under the supervision of clinical instructors in pharmacy, medicine, and dentistry. The various clerkships/externships in which students are enrolled include many areas of The University of Iowa Hospitals and Clinics; the College of Dentistry; the Veterans Affairs Medical Center; the family practice centers at Iowa City, Cedar Rapids, and Davenport; Iowa City Mercy Hospital; Mercy and St. Luke's Hospitals in Cedar Rapids; Covenant Medical Center in Waterloo; the Burlington Medical Center in Burlington; St. Joseph's Mercy Hospital in Mason City; the Marian Health Center and St. Luke's Hospital in Sioux City; the State Mental Health Institute and Henry County Hospital at Mt. Pleasant; Mary Greeley Hospital in Ames; St. Luke's and Mercy hospitals in Davenport; Mercy Health Center in Dubuque; Ottumwa Regional Health Center in Ottumwa; the Indian Health Service Hospitals in New Mexico; St. Mary's Hospital in Streator, Illinois; and numerous selected community pharmacies.

Courses

Undergraduate Pharmaceutics

46:13 Pharmacy: Math **3 s.h.**
Application of systems of weights and measures and mathematical calculations involved in pharmaceutical procedures and practices; includes lectures in statistics and its application to pharmaceutical problems.

46:14 Pharmacy: Orientation **2 s.h.**
Lectures and discussion of career opportunities, pharmacist's functions and responsibilities, practice settings, education, and professional organizations in pharmacy.

46:23 Pharmaceutics I **4 s.h.**
Lecture and laboratory on particle size measurement, characteristics of small particles, properties of solids; formulation, preparation, and evaluation of solid dosage forms. Prerequisites: 46:13 and 4:122.

46:24 Pharmaceutics II **4 s.h.**
Lecture and laboratory on application of physical and chemical laws to the formulation and preparation of liquid dosage forms, including solutions, colloids, ointments, and emulsions. Prerequisite: 46:23.

46:30 Principles of Pharmacokinetics **2 s.h.**
Computer-based version of the essential elements of 46:38; includes absorption, distribution, elimination of drugs; formulation and physiological factors reflecting these processes. Offered only through Guided Correspondence Study.

46:38 Pharmaceutics III **3 s.h.**
Fundamentals of drug absorption, distribution, and elimination and the relationship of these processes to dosing regimens; physiological, physico-chemical, and formulation factors influencing these processes. Prerequisites: 46:24 and 71:101.

46:43 Pharmaceutics IV **4 s.h.**
Lectures on availability and formulation aspects of dosage forms, including oral, topical, parenteral, ophthalmic, nasal, and otic; laboratory emphasizes techniques of compounding and dispensing, patient record systems, recognition of drug interactions, I.V. additives, and introduction to the use of computers in pharmacy. Prerequisite: 46:38.

Graduate Pharmaceutics

46:101 Pharmacy: Projects **1-3 s.h.**
Basic and applied research problems of pharmaceutical significance. Open only to students with P2 or higher standing.

46:103 Physical Pharmacy **3 s.h.**
Diffusion and mass transport phenomena related to pharmaceutical systems.

46:104 Pharmacokinetics and Biopharmaceutics **3 s.h.**
Kinetics of drug absorption, distribution, and elimination, including development of mathematical models. Consent of instructor required. Prerequisites: two semesters of calculus and one semester of statistics.

46:105 Industrial Pharmacy: Survey **2-3 s.h.**
Organization and unit operations in production of pharmaceuticals. Prerequisite: 46:24.

46:201 Surface Phenomena **3 s.h.**
Study of the behavior of matter in phase boundaries, especially adsorptive processes at liquid-solid and vapor-solid interfaces. Prerequisite: 4:131 or consent of instructor.

46:202 Pharmacy: Selected Topics **1-4 s.h.**
Recent advances and contemporary research in pharmaceutics. May be repeated.

46:206 Stability of Pharmaceuticals **3 s.h.**
Mechanisms of degradation of pharmaceuticals; prediction of shelf life of pharmaceuticals, stabilization. Offered fall semesters of odd years. Prerequisite: 4:132.

46:221 Quantitative Research Methods in Pharmacy **3 s.h.**
Lecture and laboratory; collection and interpretation of analytical data; instrumental analysis as applied to pharmaceutical quality control; separation techniques.

46:225 Product Development **3 s.h.**
Application of physiochemical principles to formulation and design of pharmaceutical dosage forms.

46:226 Product Development **3 s.h.**
Continuation of 46:225.

46:229 Advanced Pharmacokinetics and Biopharmaceutics **2 s.h.**
Advanced treatment of selected topics in pharmacokinetics and biopharmaceutics. Prerequisite: 46:104.

46:230 Selected Topics in Medicinal and Natural Products Chemistry **1-3 s.h.**

46:231 Pharmacy: Seminar **1-2 s.h.**
Reports on literature readings and research being conducted in pharmaceutical sciences. May be repeated.

46:233 Pharmacy: Research **arr.**

46:235 Physical Pharmacy **3 s.h.**
Equilibria pertaining to ionic systems, complexation, partitioning, and solubility. Prerequisite: 4:131.

Undergraduate Medicinal and Natural Products Chemistry

46:56 Non-Prescription Drugs **2 s.h.**
Consumer-oriented information about nonprescription drugs and other pharmacologically active substances. Not open to nonpharmacy freshmen. Offered to pharmacy students only pass/nonpass.

46:128 Medicinal and Natural Products Chemistry I **5 s.h.**
First of a three-semester sequence; lectures and laboratory on organic and inorganic medicinal and therapeutic agents of natural and synthetic origin; physical and chemical properties as they relate to medicinal and therapeutic effects; comparative biological activity and toxicity; detoxication mechanisms; functional group chemistry; nomenclature; chemistry of radiodiagnostic and therapeutic agents; introduction to biopharmaceutical analysis. Prerequisites: 4:122, 99:162, or equivalent; and 61:112 or equivalent.

46:131 Medicinal and Natural Products Chemistry II **5 s.h.**
Continuation of 46:128, which is prerequisite.

46:132 Medicinal and Natural Products Chemistry III **5 s.h.**
Continuation of 46:131, which is prerequisite.

46:135 Perspectives in MCNP Research **1 s.h.**
Contemporary research in medicinal chemistry and natural products, with emphasis on current faculty interests.

Graduate Medicinal and Natural Products Chemistry

46:137 Enzymatic Basis of Drug Metabolism 2 s.h.
Current literature on catalytic and physical properties, distribution, and substrate specificity of enzymes involved in mammalian drug metabolism. Prerequisites: 4:122 and 99:162, or consent of instructor.

46:150 Synthetic Strategy in Medicinal Chemistry 3 s.h.
Lectures, assigned readings, and discussion of special relevance to medicinal chemistry and drug design. Prerequisites: 4:122 and 46:132.

46:205 Stereochemistry and Conformational Analysis 2 s.h.
Basic concepts of conformational analysis; selected recent references; application of this science to design and synthesis of biologically active molecules. Prerequisite: 4:172.

46:208 Medicinal Chemistry of Nucleosides 2 s.h.
Nucleosides and nucleotides, including history, biochemical and chemical synthesis, chemical transformations, mechanism of action, resistance, and uses. Consent of instructor required.

46:209 Biopolymeric Drugs 3 s.h.
Drug applications for naturally occurring polymers such as polypeptides, hormones, enzymes, antibodies, nucleic acids, and polysaccharides; topics include synthesis, formation, delivery, pharmacokinetics, and metabolism. Prerequisites: 4:122 and 99:162, or consent of instructor.

46:211 Heterocycles 3 s.h.
Selected heterocyclic ring systems of medicinal importance; special reference to synthesis, mechanisms, and stereochemistry as related to biological effects; primarily from current literature. Prerequisites: 46:205 and 4:172.

46:212 Aspects of Drug Design 3 s.h.
Use of modern concepts of structural chemistry in the rational design and creation of new therapeutic agents; applications of chemical principles to investigation and understanding of molecular-level interactions of endogenous and exogenous organic molecules with receptor sites on macromolecules. Consent of instructor required. Prerequisites: 46:205 or 46:132 or equivalent; 71:101 or equivalent; and biochemistry.

46:215 Medicinal Chemistry: Survey 3 s.h.
Current literature on modern theoretical organic chemistry applied to study and understanding of biological phenomena; chemical and stereochemical aspects of autonomic nervous system and the chemical agents that influence it. Prerequisites: 46:132 and 71:101, or consent of instructor.

46:217 Medicinal and Natural Products Chemistry Research arr.

46:219 Separation Methods in Medicinal and Natural Products Chemistry 3 s.h.
Occurrence, distribution, isolation of primary and secondary natural products; techniques of handling and storing biological materials; emphasis on methods of isolation, including biological and phytochemical screening.

46:222 Biogenesis of Natural Products 3 s.h.
Biogenesis of acetogenins, alkaloids, aromatic compounds, and terpenes by plant and microbial systems; important groups of natural products surveyed according to biosynthetic origin; isotopic labeling methods and principles of biomimetic chemistry. Consent of instructor required.

46:223 Reaction Mechanisms of Biological Molecules 3 s.h.
Mechanistic approach to enzyme-catalyzed biological processes; emphasis on drawing detailed mechanisms of a variety of biochemical reactions and how this approach helps in designing and understanding drugs. Prerequisites: 4:122 and 99:110, or consent of instructor.

46:224 Biocatalysis in Medicinal and Natural Products Chemistry 3 s.h.
Microbial systems, fermentation conditions, and principles of biocatalysis; applications include biocatalysts as reagents in organic synthesis, microbial models of mammalian metabolism, and microbial/enzymatic transformations in natural products chemistry and biochemistry.

46:227 Medicinal and Natural Products Chemistry Seminar 1-2 s.h.

46:250 Synthetic Strategy in Medicinal Chemistry II 3 s.h.
Knowledge of chemical reactions and structure-activity relations used to design synthetic strategies for complex molecules; includes retrosynthetic analysis, generation of chirality, remote synthesis of medicinal agents. Prerequisite: 46:150 or equivalent.

Undergraduate Pharmaceutical Socioeconomics

46:22 Pharmaceutical Socioeconomics: Health Care Systems 4 s.h.
Overview of the U.S. health care delivery system, with emphasis on socioeconomic and political factors affecting health care delivery; the role of pharmacy and the pharmaceutical industry.

46:35 Pharmaceutical Socioeconomics: Practice Management 3 s.h.
Procedures necessary for good management of human and financial resources in pharmaceutical organizations; case-study approach permits student to apply principles to real-life situations.

46:41 Jurisprudence 2 s.h.
Overview of legal systems in the United States, with emphasis on contracts, torts, and related areas of civil law; in-depth study of federal food, drug, and cosmetic law, and of federal laws regulating narcotics and other dangerous drugs; discussion of state and federal laws regulating pharmacy practice and drug distribution.

46:48 Community Pharmacy Retailing 3 s.h.
Practical problems encountered by managers of community pharmacy operations; topics include starting a community pharmacy, purchasing and distribution, advertising and franchising; case-study method. Prerequisite: 46:35 or consent of instructor.

46:109 Computer Applications in Pharmacy 2 s.h.
Elements of microcomputer technology, practice in basic programming, application and uses of commercial microcomputer software, and theory and practice of community and hospital pharmacy computer systems. Consent of instructor required.

46:147 Introduction to Research Methods 3 s.h.
Scientific inquiry, experimental design, data collection, and statistical methods used in the study of health services and clinical investigations; focus on understanding the research process and evaluating published studies. Preference given to students who have had introductory statistics. Consent of instructor required.

46:154 Communications Skills for Pharmacists 3 s.h.
Elective; basic concepts and processes for effective communication between pharmacists and patients. Open only to students with P3 standing. Consent of instructor required.

46:160 Advanced Problems in Pharmaceutical Socioeconomics 1-4 s.h.
Independent study of problems in pharmaceutical socioeconomics, under supervision of a faculty member; data collection and literature review.

Graduate Pharmaceutical Socioeconomics

46:121 Drug Development and Marketing 3 s.h.
Problems inherent in developing and marketing drug products; focus on application of marketing theory and methods to the pharmaceutical industry.

46:122 Pharmaceutical Economics 4 s.h.
Economic environments of the pharmaceutical industry, all levels of the chain of drug distribution, and relevant sectors of the health care system; use of economic theory, methods, and models in studying these environments.

46:213 Pharmaceutical Socioeconomics: Seminar 1-2 s.h.
Assigned readings and discussion of recent research in pharmacy administration. May be repeated.

46:251 Pharmaceutical Socioeconomics: Research arr.

46:253 Pharmaceutical Socioeconomics: Research Methods 3 s.h.
Scientific approaches to the solution of problems in pharmacy administration; emphasis on research problems and design and their relationship. Prerequisite: 22S:102 or equivalent. Corequisite: 7P:242.

46:255 Social Pharmacy 3 s.h.

46:257 Foundation Literature in Pharmaceutical Socioeconomics arr.

Undergraduate Clinical-Hospital Pharmacy

46:44 University of Queensland Exchange, Brisbane, Australia arr.
Undergraduate exchange with the Department of Pharmacy at the University of Queensland, Brisbane, Australia. Program begins in February and ends in October. Prerequisite: three semesters of pharmacy curriculum.

46:59 Hospital Pharmacy Externship 4 s.h.
Instruction and practicum experience in various components of hospital pharmacy; numerous sites available; emphasis on hospital organization, inpatient and outpatient services, I.V. additives, unit dose, and clinical services. Open only to students with P4 standing. Consent of instructor required.

46:60 Community Pharmacy Externship 4 s.h.
Conducted primarily in community pharmacies; emphasizes communication skills with practicum and didactic education in nonprescription drug use. Open only to students with P4 standing. Consent of instructor required.

46:61 Drug Information 3 s.h.
Application of drug information resources and drug literature evaluation. Pre- or corequisite: 46:111.

46:80 Medicine Clerkship 4 s.h.
Application of therapeutic skills necessary for the pharmacotherapeutic management of patients in general medicine or the subspecialties. Open only to students with P4 standing. Consent of instructor required.

46:81 Family Practice Clerkship 4 s.h.
Primary care therapeutics; lectures and clinical practice experience in family practice offices. Open only to students with P4 standing. Consent of instructor required.

46:82 Pediatrics Clerkship 4 s.h.
Clinical experience in either general pediatrics or the subspecialties of allergy or clinical pharmacology. Open only to students with P4 standing. Consent of instructor required.

46:83 Pharmacokinetics Clerkship 4 s.h.
Instruction in the clinical application of pharmacokinetics using an institutionalized pharmacokinetics service. Open only to students with P4 standing. Consent of instructor required.

46:84 Psychiatry Clerkship 4 s.h.
Lecture and laboratory course on rational use of psychiatric drugs in treatment of psychiatric disorders. Open only to students with P4 standing. Consent of instructor required.

46:85 Neurology Clerkship 4 s.h.
Pharmacotherapeutic and pathophysiologic considerations of neurology clinical pharmacy practice. Open only to students with P4 stnading. Consent of instructor required.

46:86 Surgery Clerkship 4 s.h.
Lectures and clinical practice experience in pharmacotherapeutics on a general surgery unit. Open only to students with P4 standing. Consent of instructor required.

46:87 Clinical Nuclear Pharmacy Clerkship 4 s.h.
Includes pharmacological basis for design, chemistry, preparation, quality control, and clinical application of radiopharmaceuticals. Open only to students with P4 standing. Consent of instructor required.

46:88 Dental College Clerkship 4 s.h.
Students have frequent patient contact in specialty areas including periodontics, oral pathology, and the frail elderly clinic; readings and lectures on antimicrobials, corticosteroids, lab tests, pain control, and anesthesia. Open only to students with P4 standing. Consent of instructor required.

46:89 Elective Clerkship **4 s.h.**
Selected rotations in health care facilities. May be repeated. Open only to students with P4 standing. Consent of instructor required.

46:102 Pharmacy: Honors Seminar **1 s.h.**
Scientific, philosophical, economic, and ethical issues of importance to the practice of pharmacy.

46:110 Therapeutics I **3 s.h.**
Introduction to selected diseases and their treatment: clinical manifestations, principles of drug therapy, laboratory tests, and medical terminology. Prerequisites: 72:150, 46:131, 71:101, and 69:203.

46:111 Therapeutics II **4 s.h.**
Pharmacotherapeutics of disorders encountered primarily in internal medicine and primary care; emphasis on drug therapy management. Prerequisites: 46:110 and P4 standing.

46:161 Drug Information Clerkship **arr.**
Drug information knowledge applied to service and research projects. Open only to Pharm.D. students. Consent of instructor required.

Graduate Clinical-Hospital Pharmacy

46:114 Advanced Clinical Pharmacy **arr.**
Application of principles of pharmacology and pharmaceutics to the treatment of hospitalized patients; students participate in ward rounds and conferences with the medical staff and monitor patients on various types of drug therapy; emphasis on drug selection, adverse effects of drugs, and disease modification of therapeutic and toxic responses. Consent of instructor required. Prerequisite: 46:110.

46:115 Clinical Pharmacy: Drug Literature Review and Evaluation **2 s.h.**
Literature of hospital pharmacy practice, including clinical aspects; emphasis on techniques of evaluating biomedical literature; randomization, stratification, controls, blinding; requires an understanding of statistics. Consent of instructor required.

46:241 Nuclear Pharmacy **2 s.h.**
Design criteria and evaluation of radiopharmaceuticals; standards for nuclear pharmacy practice; administrative and managerial functions in nuclear pharmacy services; radiopharmaceutical drug information. Consent of instructor required.

46:243 Clinical-Hospital Pharmacy: Research **arr.**

46:245 Clinical-Hospital Pharmacy: Seminar **1-2 s.h.**
Topics of current interest in the specialty of clinical and hospital pharmacy. May be repeated.

Doctor of Pharmacy (Pharm.D.)

Pharm.D. standing and consent of instructor are required for all courses except 46:170.

46:170 Clinical Pharmacokinetics **3 s.h.**
Application of pharmacokinetics to the clinical setting by examining pharmacokinetic studies done in normal volunteers and diseased patients. Consent of instructor required. Prerequisite: 46:38.

46:171 Advanced Therapeutics I **3 s.h.**
In-depth analysis of selected major disease states and their drug therapy.

46:172 Advanced Therapeutics II **3 s.h.**
Continuation of 46:171.

46:173 Drug-Induced Diseases **2 s.h.**
Survey of drug-induced diseases according to a pharmacologic classification of drugs.

46:174 Fluid and Electrolyte Therapy **2 s.h.**
Theory and application of contemporary fluid and electrolyte therapies.

46:175 Clinical Investigation **1-3 s.h.**
Student participation in clinical investigations under the direction of clinical pharmacy faculty. May be repeated.

46:176 Advanced Therapeutics III **3 s.h.**
Continuation of 46:171 and 46:172. Consent of instructor required.

46:180 Medicine Clerkship **arr.**
Advanced application of therapeutic skills necessary for the pharmacotherapeutic management of patients in general medicine or other subspecialties.

46:181 Family Practice Clerkship **arr.**
Advanced clinical experience in primary care environment involving drug therapy management of a wide variety of acute and chronic medical problems in patients of all ages.

46:182 Pediatrics Clerkship **arr.**
Advanced application of clinical pharmacology/toxicology principles to optimize disease management in the inpatient and outpatient pediatric population; emphasis may be in general pediatrics or the subspecialties.

46:183 Pharmacokinetics Clerkship **arr.**
Instruction and practicum experience in clinical pharmacokinetics using an institutional pharmacokinetics service.

46:184 Psychiatry Clerkship **arr.**
Advanced application of clinical pharmacotherapeutics and pharmacokinetic psychopharmacology to the care of inpatient and outpatient psychiatric patients using a consultant role model.

46:185 Neurology Clerkship **arr.**
Lecture and advanced clinical practice of pharmacotherapeutics related to neurological diseases.

46:186 Surgery Clerkship **arr.**
Advanced application of therapeutic skills necessary for the pharmacotherapeutic management of general surgery patients.

46:187 Clinical Nuclear Pharmacy Clerkship **arr.**
Advanced clinical instruction in the uses of radiopharmaceuticals, radiopharmaceutical drug interactions, pharmacological intervention in nuclear medicine studies, and radiopharmaceutical drug information.

46:188 Dental College Clerkship **arr.**
Advanced clinical experience involving general and local anesthesia, conscious sedation and pain control, rational antibiotic therapy, and participation in management of medically compromised patients.

46:189 Pharm.D. Elective Clerkship **arr.**
Advanced clinical experience in a nontraditional setting.

Continuing Education

Dean: Emmett J. Vaughan

The Division of Continuing Education was established by special legislation of the General Assembly of Iowa to "render a larger service to the Commonwealth and to the people of Iowa by carrying out to every part of the State the knowledge, the thought, the ideals, and the spirit of several departments and colleges of the University and by bringing the University generally into direct contact with the citizens."

The division's organization and services include the following.

Audiovisual Center

Director: William Oglesby

The Audiovisual Center helps faculty and students improve the teaching/learning process through consultation, planning, design, production, and marketing of instructional audiovisual materials.

The center's media production units are the University's major manufacturers of a broad range of graphic, photographic, and audio materials. The units and their products are:

- Graphics Unit: graphs, charts, maps, titles, layouts, posters, illustrations, models, exhibits, and overhead transparencies;
- Photographic Service: black-and-white and color photographs, negatives, two-inch slides, filmstrips, portraits, macrophotographs, many types of specialized photography, and still photographic laboratory services;
- Audio Unit: original audiotape recording (studio and location), tape duplication (open reel and cassette), sound editing, equalizing, mixing, and transfer;
- Multi-image Unit: design and production of single- and multiple-screen slide programs, one to twelve projectors, manual and programmed control, open-reel and cassette sync/sound track. The Audiovisual Center also markets and distributes audiovisual products originated at the University. Nominal royalties are paid to sponsoring University departments and authors.

The center charges most University departments for materials only. For requests funded by grants, charges are made for materials and labor.

Media Services

The University Media Library provides a major collection of 16 mm instructional films and videotapes without charge for on-campus instruction and curriculum-related activities, and for off-campus rental. Smaller collections of audiotapes, filmstrips, and slides, plus facilities for student or faculty utilization, also are available. Catalogs of these collections are available on request. The library also maintains a reference collection of materials from other sources.

Equipment Services provides the following at no charge for instructional use: projectors for films, slides, filmstrips, and videos; opaque and overhead projectors; portable projection screens; audiotape recorders; record players; videocassette recorders/players; portable public-address systems; and display devices (exhibits, easels, boards). Repair service is available for audiovisual equipment.

Center for Conferences and Institutes

Acting director: George J. Lopos

The Center for Conferences and Institutes serves as the principal agency of the University for developing, coordinating, and conducting noncredit continuing education programs for nonresident adults and for administering the University's Continuing Education Unit (CEU) program. The center's primary goal is to enhance the usefulness of the University as a center of learning and to provide educational opportunities for people who are not full-time students but who seek new knowledge related to their jobs, professions, or special interests.

Each year more than 30,000 adults participate in the center's varied programs, which represent a cooperative endeavor between the center and the colleges, departments, and service units of the University. The marshaling of appropriate resources, coupled with professional planning and execution of conferences and other short-term programs, helps to ensure the achievement of the educational objectives specified for each program.

The director of conferences approves and center staff conduct or coordinate all conferences, institutes, short courses, and other noncredit continuing education programs held in the Iowa Memorial Union for groups other than on-campus students. The *University Operations Manual* directs faculty and staff who plan University conferences and group functions held on campus or in Iowa City and Coralville to schedule these activities through the conference center office. The center uses conference facilities, dining services, and lodging accommodations at the Iowa Memorial Union when available and appropriate.

The conference center also manages national and international programs for faculty and departments.

Center for Credit Programs

Director: Von V. Pittman

The Center for Credit Programs is responsible for the delivery of University of Iowa credit courses to part-time students in Iowa City and throughout the state. In cooperation with the University's colleges and academic departments, the center offers courses through several formats and delivery systems.

Correspondence Courses

More than 180 Guided Correspondence Study courses are available in the Colleges of Liberal Arts, Business Administration, Education, Engineering, Medicine, and Nursing. These courses represent a total of 42 University departments. Students may enroll at any time, and they have nine months in which to complete work. A catalog of course listings, procedures, and enrollment forms may is available from Guided Correspondence Study, 116 International Center.

Off-Campus Classes

The Center for Credit Programs offers University courses off-campus. Classes are scheduled where they may best serve off-campus students, at the request of public school officials, and/or where professional, industrial, or other qualified groups indicate a specific need for instruction. The center also offers courses through audioconferencing and interactive television. In addition, it provides a variety of telecourses in cooperation with Iowa Public Television. Enrollment in each course must be sufficient to meet the cost of offering the course. Information is available from the Center for Credit Programs, 116 International Center.

Saturday and Evening Classes

The Saturday and Evening Class Program offers University courses at times convenient for nontraditional students. All classes meet on The University of Iowa campus. Enrollment in each course must be sufficient to meet the cost of offering the course. The bulletin of the Saturday and Evening Class Program is available from the Center for Credit Programs, 116 International Center.

Bachelor of Liberal Studies Degree

The Bachelor of Liberal Studies degree is offered by each of the three Iowa Regents universities (The University of Iowa, Iowa

State University, and the University of Northern Iowa) to serve adults whose job, family, geographic location, or other personal circumstances prevent them from attending college as full-time, on-campus students. The program has no residence requirement.

Credit applicable toward the degree may be earned through Saturday and evening courses, correspondence and independent study courses, off-campus courses at sites throughout Iowa, televised courses, and daytime on-campus courses.

At The University of Iowa, the B.L.S. is awarded by the College of Liberal Arts and administered by the Division of Continuing Education. For a detailed program description, see "Liberal Studies" in the "College of Liberal Arts" section of the *Catalog*.

Labor Center

Director: Roberta Till-Retz

The Labor Center targets instruction to the specific needs of the labor movement in Iowa. Staff members combine on-campus and off-campus programs to reach as many people as possible.

Institute of Public Affairs

Acting director: Tim J. Shields

The mission of the institute is to help strengthen state, city, and county governments in Iowa by serving as the primary research and continuing education link to the University. Institute services are available to state and local government agencies and to citizen groups interested in civic affairs.

The institute's full-time research and training staff apply University resources to problems faced by Iowa public officials. The institute also works in close cooperation with organizations of public officials, such as the League of Iowa Municipalities and the Iowa State Association of Counties.

The institute provides the following:

- In-service training and continuing education services to public officials, primarily policymakers and key administrators, with a wide variety of information sources and educational programs aimed at meeting organizational and leadership development needs;
- Research services, informational resources, and publications ranging from Iowa public policy studies to handbooks for elected officials in Iowa governments; and
- Organizational assistance ranging from advising on city council goal setting, management systems, and quality circles to serving on statewide government committees that deal with major concerns of state and local governments.

Radio Broadcasting Services

Acting director: John Monick

WSUI and KSUI-FM extend the resources and activities of the University to the people of eastern Iowa with 18 hours of daily broadcasting. The broadcast schedule consists of educational, cultural, and informational programming not generally available elsewhere. As an affiliate of National Public Radio (NPR), WSUI contributes program materials to a national network of more than 300 noncommercial radio stations. The main studios and offices are located in 3300 Engineering Building, and a free copy of the WSUI-KSUI *Program Guide* is available from that address.

Video Center

Director: Daniel G. Lind

The University Video Center provides high-quality video services and facilities, including those necessary to sustain and promote research activities. It also coordinates video equipment purchase and inventory and promotes efficient University support of campus video. Toward this end, the center has the personnel and facility resources to assist units in the purchase of equipment and supplies, and in production and postproduction activities. Additionally, the center provides video system design and maintains guidelines for equipment standardization.

Administrative Officers

State Board of Regents

The State Board of Regents governs The University of Iowa, Iowa State University of Science and Technology, the University of Northern Iowa, the Iowa Braille and Sight-Saving School, and the Iowa School for the Deaf. The Board consists of nine members, as follows.

President: Marvin A. Pomerantz, West Des Moines
Marvin S. Berenstein, Sioux City
Betty Jean Furgerson, Waterloo
John R. Fitzgibbon, West Des Moines
John M. Greig, Estherville
Elizabeth D. Hatch, Cedar Rapids
James R. Tyler, Atlantic
Vikki Westenfield, Huxley
Mary C. Williams, Davenport
Executive secretary: R. Wayne Richey

Central Administration

President: Hunter R. Rawlings III
Vice president for academic affairs and dean of faculties: Peter E. Nathan
Vice president for research: James Morrison
Vice president for finance and university services: Susan M. Phillips
Vice president and director, Opportunity at Iowa: Philip G. Hubbard

Academic Affairs

Vice president and dean of faculties: Peter E. Nathan

College of Business Administration

Dean: George Daly
Ira B. McGladrey Institute of Accounting Research director: Bruce Johnson
Economic Research Institute director: Charles Whiteman
Entrepreneurial Management Institute director: Henry Madden

College of Dentistry

Dean: James H. McLeran
Dows Institute for Dental Research director: Christopher A. Squier

College of Education

Interim dean: Lowell D. Schoer
Iowa Institute for School Executives director: Larry Bartlett

College of Engineering

Dean: Robert G. Hering
Institute of Hydraulic Research director: John F. Kennedy
Iowa Institute for Biomedical Research director: Kwan Rim

Graduate College

Acting dean: Rudolph W. Schulz

College of Law

Dean: N. William Hines

College of Liberal Arts

Dean: Gerhard Loewenberg

College of Medicine

Dean: John W. Eckstein

College of Nursing

Dean: Geraldene Felton

College of Pharmacy

Dean: Robert A. Wiley

Division of Continuing Education

Dean: Emmett J. Vaughan
Audiovisual Center director: William Oglesby
Center for Conferences and Institutes acting director: George J. Lopos
Center for Credit Programs director: Von V. Pittman
Institute of Public Affairs acting director: Tim J. Shields
Labor Center director: Roberta Till-Retz
Radio Stations WSUI-KSUI acting director: John Monick

Libraries

University librarian: Sheila Creth

Budget and Planning

Acting associate vice president: Leodis Davis

Iowa Lakeside Laboratories

Acting director: Robert W. Cruden

Summer Session

Director: Christine Quinn

Student Academic Affairs

Acting associate vice president: T. Anne Cleary

Admissions

Director: Michael Barron

Registrar

Jerald W. Dallam

University Evaluation and Examination Service

Acting director: Joyce E. Moore

Undergraduate Academic Advising Center

Director: Juliet Kaufmann

Student Administrative Services

Associate vice president: Phillip E. Jones

Residence Services

Director: George L. Droll

Iowa Memorial Union

Director: Jean Kendall

University Counseling Service

Director: Gerald L. Stone

Special Support Services

Director: Rosalyn Green

Student Financial Aid

Director: Mark S. Warner

Campus Programs and Student Activities

Director: Kevin Taylor

Office of Services for Persons with Disabilities

Director: Donna Chandler

Women's Resource and Action Center

Director: Papusa Molina

International and Cultural Affairs

Associate vice president: Fredrick Woodard

Office of International Education and Services

Director: Stephen M. Arum

Iowa Center for the Arts

Chair: Fredrick Woodard

Hancher Auditorium

Director: Wallace Chappell

Museum of Art

Director: Mary Kujawski

Research

Vice president: James Morrison

Division of Sponsored Programs

Director: Margery E. Hoppin

Institute for Child Behavior and Development

Acting director: Derek Willard

Center for Health Services Research

Acting director: Robert L. Ludke

Office of Information Technology
Director: Fred H. Harris

Weeg Computing Center
Director: W. Lee Shope

University Occupational Health Service
Director: Laurence Fuortes

Health Protection Office
Director: William E. Twaler

State Archaeologist
William Green

Technology Innovation Center
Director: W. Bruce Wheaton

University House
Director: Jay Semel

University of Iowa Press
Director: Paul Zimmer

Animal Care Unit
Director: Paul S. Cooper

Finance and University Services

Vice president: Susan M. Phillips

Business Office
Business manager: Michael J. Finnegan
Treasurer: Douglas K. True
Controller and secretary: Douglas M. Young

University Personnel Services
Director: Marvin Lynch

Planning and Administrative Services
Director: Richard E. Gibson

Intercollegiate Athletics for Men
Director: Chalmers W. Elliott

Intercollegiate Athletics for Women
Director: Christine Grant

Recreational Services
Director: Harry R. Ostrander

University Health Services

Assistant to the president for statewide health services: John W. Colloton

University Hospitals and Clinics
Director: John W. Colloton

Psychiatric Hospital
Director: George Winokur

State Hygienic Laboratory
Director: William J. Hausler

University Hospital School
Director: Alfred Healy

Student Health Service
Director: Mary L. Khowassah

Regional Child Health Specialty Clinics
Director: Richard P. Nelson

General University

Affirmative Action Office
Acting director: Susan L. Mask

Alumni Association
Executive director: D. Richard Emerson

University of Iowa Foundation
President: Darrell D. Wyrick

University Relations
Acting director and assistant to the president: Ann M. Rhodes

Eckstein Medical Research Building

Faculty

The following persons held University of Iowa faculty appointments with the rank of instructor, assistant professor, associate professor, or professor May 1, 1990. In this listing, the year of first apointment follows the departmental identification, and the year of present appointment is given in parentheses.

Abbas, Paul J., B.S. Massachusetts Institute of Technology 1969, Ph.D. Johns Hopkins 1974; *professor, Speech Pathology and Audiology/Otolaryngology-Head & Neck Surgery 1974 (1984)*

Abboud, Francois, Baccalaureate Christian Brothers' Schools (Egypt) 1948, PNS Cairo (Egypt) 1949, M.B.B.Ch. Ain Chams (Egypt) 1955; *Edith King Pearson professor of Cardiovascular Research, Internal Medicine/Physiology and Biophysics, 1960 (1968)*

Abrams, Michael E., B.A. Luther 1963, M.D. Iowa 1967; *clinical assistant professor, Family Practice, 1972 (1977)*

Abu-Yousef, Monzer M., M.B., B.Ch. Cairo (Egypt) 1970; *associate professor, Radiology, 1976 (1985)*

Achepohl, Keith A., B.A. Knox 1956, M.F.A. Iowa 1960; *professor, School of Art and Art History, 1973 (1981)*

Acton, Patricia N., B.A. Iowa 1971, J.D. 1974; *clinical professor, Law, 1981 (1985)*

Adams, Harold P., B.A. Drake 1966, B.S. South Dakota (Vermillion) 1968, M.D. Northwestern 1970; *professor, Neurology, 1976 (1985)*

Adams, Paul L., M.A. Oxford (England) 1964, Dipl. London School of Economics 1968, M.S.W. Sussex (England) 1970, D.S.W. California (Berkeley) 1979; *associate professor, School of Social Work, 1979 (1981)*

Addis, Laird, B.A. Iowa 1959, M.A. Brown 1960, Ph.D. Iowa 1964; *professor, Philosophy, 1963 (1974)*

Afifi, Adel K., B.A. American University of Beirut (Lebanon) 1951, M.D. 1957, M.S. Iowa 1965; *professor, Pediatrics/Anatomy/Neurology, 1973 (1984)*

Ahrens, Richard C., B.S. Wisconsin (Madison) 1969, M.D. Medical College of Wisconsin 1973, M.S. Iowa 1980; *associate professor, Pediatrics, 1980 (1987)*

Aikin, Judith P., B.A. Oregon 1968, M.A. 1969, Ph.D. California (Berkeley) 1974; *professor, German, 1975 (1988)*

Al-Bakri, Aladdin Y., B.S. Iowa 1983, M.S. 1988; *adjunct assistant professor, Urban and Regional Planning/Civil and Environmental Engineering, 1990*

Albanese, Mark A., B.S. Nebraska 1973, M.A. 1975, Ph.D. Iowa 1981; *adjunct associate professor, Preventive Medicine and Environmental Health/Psychological and Quantitative Foundations, 1986 (1987)*

Albrecht, William P., B.A. Princeton 1956, M.A. South Carolina 1962, M.A. Yale 1963, Ph.D. 1965; *professor, Economics, 1965 (1982)*

Albright, John P., A.B. Illinois 1963, M.D. Loyola University (Chicago) 1967; *professor, Orthopaedic Surgery, 1972 (1981)*

Alden, L. Elizabeth, B.A. Lawrence 1941, M.A. Mills 1943, Ph.D. Wayne State 1960; *associate professor emeritus, Home Economics, 1963 (1985)*

Alessi, Stephen M., B.A. Rochester 1973, M.A. Illinois 1976, Ph.D. 1979; *associate professor, Psychological and Quantitative Foundations, 1982 (1988)*

Alexander, Bruce, B.S. Drake 1974, Pharm.D. Minnesota 1976; *clinical associate professor, Pharmacy/Psychiatry, 1976 (1985)*

Alexander, Donald P., B.S.P.H. Ohio State 1978, Pharm. D. Utah 1981; *associate professor, Pharmacy, 1989*

Alexander, Margaret A., B.A. Wheaton 1938, M.A. New York 1941, Ph.D. 1958; *professor emeritus, School of Art and Art History/Classics, 1962 (1986)*

Alexander, Randell C., B.S. Michigan State 1975, M.A. Michigan 1974, M.D. Wayne State 1980, Ph.D. Michigan 1984; *associate professor, Pediatrics, 1984 (1990)*

Alexander, Robert L., B.A. Queens 1942, A.M. New York 1942, Ph.D. 1961; *professor emeritus, School of Art and Art History, 1961 (1987)*

Alexander, Saramma J., M.B.B.S. Christian Medical School (India) 1965; *clinical assistant professor, Internal Medicine, 1979*

Alipour-Haghighi, Fariborz, B.S. Tehran (Iran) 1971, M.S. 1971, Ph.D. Iowa 1981; *adjunct associate professor, Speech Pathology and Audiology, 1985 (1988)*

Al-Jurf, Adel S., M.B.Ch.B. Cairo (Egypt) 1966; *professor, Surgery, 1977 (1986)*

Allen, Daniel P., B.S. Creighton 1979, M.D. Iowa 1983; *clinical assistant professor, Internal Medicine, 1988 (1989)*

Allen, Larry L., B.S. Iowa 1973, M.S.W. 1977; *adjunct instructor, School of Social Work, 1987*

Allen, Susan D., B.S. Colorado 1966, Ph.D. Southern California 1971; *professor, Chemistry/ Electrical and Computer Engineering, 1987*

Alley, Louis E., B.S.Ed. Central Missouri State Teachers 1935, M.S. Wisconsin 1941, Ph.D. Iowa 1949; *professor emeritus, Exercise Science, 1942 (1982)*

Alt, L. Peter, B.S. Iowa 1970, M.D. 1973; *clinical assistant professor, Otolaryngology-Head and Neck Surgery, 1985*

Alter, Catherine F., B.A. Grinnell 1960, M.S.W. Iowa 1975, Ph.D. Maryland 1985; *associate professor, School of Social Work, 1980 (1988)*

Altmaier, Elizabeth M., B.A. Wheaton 1973, M.A. Ohio State 1975, Ph.D. 1977; *professor, Psychological and Quantitative Foundations, 1980 (1989)*

Altman, Charles F., A.B. Duke 1966, M.A. 1966, Ph.D. Yale 1971; *professor, French and Italian/Communication Studies, 1974 (1986)*

Altman, Janet G., B.A. Duke 1967, M.Ph. Yale 1970, Ph.D. 1973; *associate professor, French and Italian, 1974 (1978)*

Alton, Donald A., B.A. Rice 1965, Ph.D. Cornell 1970; *professor, Computer Science, 1970 (1981)*

Alton, Everett D., B.A. Iowa State Teachers 1939, M.S.E.E. Iowa 1955; *associate professor emeritus, Electrical and Computer Engineering, 1955 (1980)*

Alward, Wallace L. M., A. B. Kenyon 1973, M.D. Ohio State 1976; *assistant professor, Ophthalmology, 1987*

Amada, Kenneth, B.A. Rutgers 1951; *professor, School of Music, 1967 (1976)*

Ambrose, Maureen L., B.A. California (Santa Barbara) 1980, M.A. Illinois 1983, Ph.D. 1986; *assistant professor, Management and Organizations, 1985 (1986)*

Amert, Kay L., B.G.S. Iowa 1972; *associate professor, School of Journalism and Mass Communication, 1972 (1982)*

Anaya, Stephen J., B.A. New Mexico 1980, J.D. Harvard 1983; *associate professor, Law, 1988*

Andersen, David R., B.S.E.E. Iowa State 1981, M.S.E.E. Purdue 1982, Ph.D. 1986; *assistant professor, Electrical and Computer Engineering, 1986*

Andersen, Eric G., B.A. Brigham Young 1974, J.D. 1977; *professor, Law, 1984 (1988)*

Andersland, Mark S., B.S.E. Michigan 1983, M.S.E. 1984, Ph.D. 1989; *assistant professor, Electrical and Computer Engineering, 1989*

Anderson, Barrie, B.S. Wisconsin 1963, M.D. S.U.N.Y. (Upstate Medical College) 1967; *associate professor, Obstetrics and Gynecology, 1982*

Anderson, Charles V., B.S. Nebraska 1955, M.A. 1957, Ph.D. Pittsburgh 1962; *associate professor, Speech Pathology and Audiology, 1966 (1968)*

Anderson, Daniel D., B.A. Iowa 1971, M.S. Chicago 1971, Ph.D. 1974; *professor, Mathematics, 1974 (1983)*

Anderson, Duane D., B.S. Wisconsin 1952, M.A. Northwestern 1955, Ph.D. Michigan 1969; *associate professor, Planning, Policy and Leadership Studies, 1965 (1970)*

Anderson, Erling A., B.A. Wisconsin 1972, M.A. Iowa 1981, Ph.D. 1984; *assistant professor, Anesthesia, 1989*

Anderson, Jeannette M., B.S.N. Coe 1979, M.A. Iowa 1983; *adjunct instructor, Nursing, 1988*

Anderson, Kenneth W., B.S. Illinois 1968, M.D. Northwestern 1972; *clinical assistant professor, Pediatrics, 1975*

Anderson, Paul G., B.M. Iowa 1948, M.A. 1949; *professor emeritus, School of Music, 1949 (1989)*

Anderson, Peter E., B.A. Graceland 1973, M.D. Iowa 1978; *clinical instructor, Anesthesia, 1982*

Anderson, Ralph E., B.A. Minnesota 1950, M.S.W. Nebraska 1953; *professor emeritus, School of Social Work, 1963 (1986)*

Anderson, Robert W., B.A. Iowa 1955, M.D. 1955; *clinical assistant professor, Pediatrics, 1976*

Andreasen, Nancy C., B.A. Nebraska 1958, M.A. Radcliffe 1959, Ph.D. Nebraska 1963, M.D. Iowa 1970; *professor, Psychiatry, 1963 (1981)*

Andrew, J. Dudley, B.A. Notre Dame 1967, M.F.A. Columbia 1969, Ph.D. Iowa 1972; *Angelo Bertocci professor of Critical Studies, Communication Studies/ Comparative Literature, 1969 (1980)*

Andrews, James G., B.S.M.E. Iowa 1957, M.S. 1959; *professor, Mechanical Engineering/ Exercise Science, 1964 (1983)*

Andringa, Dale J., B.A. Calvin 1972, M.D. Iowa 1976; *clinical assistant professor, Internal Medicine, 1984*

Ansley, Timothy N., B.A. Eastern Illinois 1974, M.S. Northern Illinois 1977, Ph.D. Iowa 1984; *associate professor, Psychological and Quantitative Foundations, 1983 (1989)*

Anstey, B. Eleanor, B.A. Marycrest 1953, M.A. Creighton 1959, M.A. Manhattanville 1968, Ph.D. Iowa 1983; *assistant professor, School of Social Work, 1974 (1978)*

Antczak, Frederick J., B.A. Notre Dame 1974, M.A. Chicago 1976, Ph.D. 1979; *associate professor, Rhetoric, 1987 (1989)*

Antes, Joella J., B.S. Iowa State 1941, M.A. Chicago 1952; *assistant professor emeritus, Nursing, 1941 (1972)*

Anthony, Tas, B.A. Northeast Missouri State 1968, M.A. Iowa 1975; *adjunct instructor, Curriculum and Instruction, 1986*

Appleby, Ralph C., B.S. Iowa 1941, D.D.S. 1951, M.S. 1953; *professor emeritus, Prosthodontics, 1951 (1981)*

Aquilino, Steven A., B.S. SUNY (Binghamton) 1975, D.D.S. North Carolina 1979, M.S. 1982; *associate professor, Prosthodontics, 1982 (1987)*

Arab, Siddi Moahmed, M.B.B.S. King Edward Medical (Pakistan) 1965, D.C.H. Royal College of Physicians and Surgeons (United Kingdom) 1969; *clinical assistant professor, Pediatrics, 1977*

Argenyi, Zsolt B., M.D. Semmelweis (Hungary) 1978; *assistant professor, Pathology/Dermatology, 1986*

Arkema, Vicki L., B.S.N. Iowa Wesleyan 1976, M.A. Iowa 1984; *adjunct instructor, Nursing, 1985*

Arkush, R. David, B.A. Yale 1962, A.M. Harvard 1964, Ph.D. 1976; *professor, History, 1972 (1988)*

Armens, Sven M., B.A. Tufts 1943, M.A. Harvard 1947, Ph.D. 1951; *professor emeritus, English, 1950 (1986)*

Armstrong, Marc P., B.S. SUNY (Plattsburgh) 1974, M.A. North Carolina (Charlotte) 1978; *assistant professor, Geography/Computer Science, 1984*

Armstrong, Mark L., B.A. Houghton 1942, M.D. Columbia 1951; *professor, Internal Medicine, 1955 (1971)*

Armstrong, Rhonda, B.A. Emporia State 1973, M.S.W. Kansas 1975; *adjunct instructor, School of Social Work, 1982*

Arnold, Mark A., B.S. Indiana-Purdue 1978, Ph.D. Delaware 1982; *associate professor, Chemistry, 1982 (1988)*

Arnone, Arthur, B.S. New York 1964, M.S. 1966, Ph.D. Massachusetts Institute of Technology 1970; *professor, Biochemistry, 1973 (1983)*

Arora, Jasbir S., B.S. Punjab (India) 1964, M.S. Kansas State 1967, Ph.D. Iowa 1971; *professor, Civil and Environmental Engineering/Mechanical Engineering/Physical Therapy, 1972 (1981)*

Arrington, C. Edward, B.A. Southern Mississippi 1972, M.A. 1974, D.B.A. Florida State 1980; *associate professor, Accounting, 1985*

Arthur, Chris R., B.A. Dillard 1973, M.A. Ohio State 1974, Ph.D. 1981; *assistant professor, Curriculum and Instruction, 1989*

Arum, Stephen M., B.A. Hobart 1961, M.A.T. Yale 1964, Ed.D. Columbia 1975; *adjunct assistant professor, Planning, Policy and Leadership Studies, 1979*

Aschenbrener, Carol A., B.S. Clarke 1966, M.S. Iowa 1968, M.D. North Carolina 1971; *professor, Pathology, 1974 (1987)*

Ascoli, Mario, B.S. San Carlos 1971, Ph.D. Vanderbilt 1975; *professor, Pharmacology, 1990*

Ascroft, Joseph R., B.Soc.Sc. Capetown (South Africa) 1956, M.A. Michigan State 1966, Ph.D. 1969; *professor, School of Journalism and Mass Communication, 1970 (1982)*

Ash, Mitchell G., B.A. Amherst 1970, M.A. Harvard 1973, Ph.D. 1982; *associate professor, History, 1983 (1989)*

Ashman, Robert F., B.A. Wabash 1960, B.A. Oxford (England) 1962, M.A. 1966, M.D. Columbia 1966; *professor, Internal Medicine/Microbiology, 1980*

Asprey, Gene M., B.S. Morningside 1947, M.S. Colorado 1953, Ph.D. Iowa 1958; *professor, Exercise Science, 1959 (1970)*

Atcherson, Walter T., B.A. Gustavus Adolphus 1953, Ph.D. Indiana 1960; *professor, School of Music, 1964 (1972)*

Atkins, Dianne L., B.A. Johns Hopkins 1974, M.D. 1977; *assistant professor, Pediatrics, 1986*

Atkinson, Alice M., B.S. Iowa State 1961, M.S. Wisconsin 1963, Ph.D. Iowa 1982; *assistant professor, Home Economics, 1973 (1982)*

Atkinson, Kendall E., B.S. Iowa State 1961, M.S. Wisconsin 1963, Ph.D. 1966; *professor, Mathematics, 1972 (1975)*

Aubrey, Elizabeth, B.A. Grinnell 1973, M.M. Maryland 1975, Ph.D. 1982; *associate professor, School of Music, 1982 (1988)*

Aydelotte, Myrtle, B.S. Minnesota 1939, M.A. 1948, Ph.D. 1955; *professor emeritus, Nursing, 1949 (1984)*

Aydelotte, William O., B.A. Harvard 1931, Ph.D. Cambridge (England) 1934; *Carver professor emeritus, History, 1947 (1978)*

Babb, Florence E., B.A. Tufts 1973, M.A. SUNY (Buffalo) 1976, Ph.D. 1981; *associate professor, Anthropology/Women's Studies, 1982 (1988)*

Bader, Iva Marie, B.S. Iowa State Teachers 1935, M.A. Iowa 1963; *assistant professor emeritus, Home Economics/Curriculum and Instruction, 1964 (1982)*

Baender, Paul, B.A. California (Berkeley) 1949, M.A. 1952, Ph.D. 1956; *professor, English, 1960 (1968)*

Baenziger, Norman C., B.S. Hamline 1943, Ph.D. Iowa State 1948; *professor, Chemistry, 1949 (1957)*

Bagford, Jack, M.Ed. Miami (Ohio) 1956, Ed.D. Indiana 1960; *professor, Curriculum and Instruction, 1962 (1970)*

Bailey, George B., B.A. Iowa 1969, M.S. 1971, Ph.D. Stanford 1975; *adjunct professor, Geology, 1979*

Baird, Robert D., B.A. Houghton 1954, B.D. Fuller Theological Seminary 1957, S.T.M. Southern Methodist 1958, Ph.D. Iowa 1964; *professor, School of Religion, 1966 (1974)*

Baker, Coy M., B.A. Drake 1972, M.A. Iowa 1976; *adjunct instructor, Nursing, 1985*

Baker, Karen A., B.S. Pharm. Iowa 1979, M.S. 1981; *assistant professor, Oral and Maxillofacial Surgery/Pharmacy 1981 (1985)*

Baker, Max T., B.S. Georgia 1975, M.S. 1978, Ph.D. 1980; *assistant professor, Anesthesia, 1989*

Baker, Richard G., B.A. Wisconsin 1960, M.A. Minnesota 1964, Ph.D. Colorado 1969; *professor, Geology/Botany, 1970 (1982)*

Baker, Richard L., B.A. Drake 1972, M.S. Iowa 1979, Ph.D. California (Berkeley) 1987; *assistant professor, Mathematics, 1989*

Baker, Sharon L., B.S. Ohio State 1978, M.L.S. Kent State 1980, Ph.D. Illinois 1985; *associate professor, School of Library and Information Science, 1987 (1990)*

Balakrishnan, Ramamurthy, M.B.A. India Institute of Management 1979, M.A. Columbia 1985, Ph.D. 1986; *assistant professor, Accounting, 1986*

Balasubramanian, Siva K., B.S. Osmania (India) 1974, M.B.A. 1976, Ph.D. SUNY at Buffalo 1986; *assistant professor, Marketing, 1986*

Balch, Michael S., B.S. Pratt 1960, M.S. New York 1962, Ph.D. 1965; *associate professor, Economics, 1971*

Baldus, David C., A.B. Dartmouth 1957, M.A. Pittsburgh 1962, L.L.B. Yale 1964, L.L.M. 1969; *Joe B. Tye professor, Law, 1969 (1972)*

Bale, James F., Jr., B.S. Michigan 1971, M.D. 1975; *professor, Pediatrics/Neurology, 1982 (1990)*

Ballas, Zuhair K., B.S. American University of Beirut (Lebanon) 1970, M.D. 1974; *associate professor, Internal Medicine, 1980 (1986)*

Baller, John T., B.S. Nebraska 1967, M.D. 1971; *clinical assistant professor, Internal Medicine, 1974 (1979)*

Balon, Thomas W., B.S. S.U.N.Y. (Brockport) 1975, M.S. Ball State 1976, Ph.D. Toledo/Medical College of Ohio 1983; *assistant professor, Exercise Science, 1986*

Bar, Robert S., B.S. Tufts 1964, M.S. Ohio State 1970, M.D. 1970; *professor, Internal Medicine, 1977 (1986)*

Barcelo, Nancy V., B.A. Chico State 1969, M.A. Iowa 1972, Ph.D. 1980; *adjunct assistant professor, Counselor Education, 1981*

Bardach, Janusz, M.B. Moscow Medical Institute (U.S.S.R.) 1950, M.D. 1953; *professor emeritus, Otolaryngology-Head and Neck Surgery/Surgery, 1972 (1990)*

Barfknecht, Charles F., B.S. Wisconsin 1960, Ph.D. Kansas 1964; *professor, Pharmacy, 1967 (1974)*

Barkan, Joel D., A.B. Cornell 1963, M.A. California (Los Angeles) 1965, Ph.D. 1970; *professor, Political Science, 1972 (1981)*

Barloon, Thomas J., B.S. Loras 1971, M.D. Wisconsin 1975; *assistant professor, Radiology, 1986*

Barnes, Billy L., B.S. Austin 1947, M.B.A. Texas Christian 1949, Ph.D. Illinois 1958, C.P.A.; *professor emeritus, Accounting, 1955 (1987)*

Baron, Jeffrey, B.S. Connecticut 1965, Ph.D. Michigan 1969; *professor, Pharmacology, 1972 (1980)*

Baron, Robert J., A.B. San Diego State 1963, M.S. Cornell 1965, Ph.D. 1968; *associate professor, Computer Science, 1970 (1974)*

Baron, Robert S., B.S. Cornell 1965, Ph.D. Minnesota 1970; *professor, Psychology, 1970 (1982)*

Barrett, Clarence F., D.D.S. Iowa 1944; *adjunct assistant professor, Preventive and Community Dentistry, 1974*

Barrick, Murray R., B.A. Northern Iowa 1980, M.A. Akron 1986, Ph.D. 1988; *assistant professor, Management and Organizations, 1988*

Bartlett, Larry D., B.A. Northern Iowa 1964, J.D. Nebraska 1974, Ph.D. Iowa State 1983; *associate professor, Planning, Policy and Leadership Studies, 1985 (1988)*

Bartlett, William G., B.S. Morningside 1967, D.O. College of Osteopathic Medicine 1971; *clinical assistant professor, Pediatrics, 1977*

Barton, Lonnie D., D.D.S. Iowa 1986; *adjunct assistant professor, Preventive and Community Dentistry, 1986*

Barudin, Barry S., A.B. Lafayette 1968, M.D. Chicago Medical School 1972; *clinical assistant professor, Pediatrics 1978*

Bassiri, Rahim M., M.D. Tehran (Iran) 1965; *clinical assistant professor, Internal Medicine, 1974*

Bate, Walter W., B.A. Wheaton 1971, M.D. Illinois 1977; *clinical assistant professor, Internal Medicine, 1984*

Bates, James N., B.A. California (Santa Barbara) 1972, M.A. 1975, Ph.D. 1977, M.D. Miami 1981; *associate professor, Anesthesia, 1984 (1990)*

Bauer, Patrick B., B.A. Wesleyan 1972, J.D. Chicago 1975; *professor, Law, 1979 (1985)*

Baughman, Glenn R., B.S. Bluffton 1963, M.S.W. Iowa 1967; *adjunct instructor, School of Social Work, 1986*

Baumbach, Diane, B.A. Iowa 1973, M.S.W. 1974; *adjunct instructor, School of Social Work, 1982*

Baumbach, Gary L., B.A. Wartburg 1971, M.D. Iowa 1976; *associate professor, Pathology, 1985 (1990)*

Baumback, Clifford M., B.S. Springfield 1938, M.B.A. Northwestern 1945, Ph.D. Iowa 1953; *professor emeritus, Finance, 1953 (1980)*

Bayne, David C., A.B. Detroit 1939, M.A. Loyola (Chicago) 1947, LL.B. Georgetown 1947, LL.M. 1948, S.J.D. Yale 1949, S.T.L. Loyola (Chicago) 1953, LL.D. Creighton 1980; *professor emeritus, Law, 1967 (1988)*

Beadles, Charles E., D.D.S. Missouri (Kansas City) 1962; *adjunct assistant professor, Preventive and Community Dentistry, 1981*

Bealka, Richard J., B.S. St. Thomas 1952, M.D. St. Louis 1956; *clinical assistant professor, Psychiatry, 1971 (1976)*

Beams, Harold W., B.A. Fairmount 1925, M.A. Northwestern 1926, Ph.D. Wisconsin 1929; *professor emeritus, Biology, 1930 (1971)*

Beasley, Byron T., B.A. St.Olaf 1970, M.D. Iowa 1974; *clinical assistant professor, Internal Medicine, 1984*

Beasley, Oscar C., B.S. Kentucky 1948, M.D. Vanderbilt 1952; *clinical associate professor, Internal Medicine, 1958 (1975)*

Bechtoldt, Harold, B.A. Kansas State Teachers 1936, B.S.Ed. 1936, Ph.D. Chicago 1947; *professor emeritus, Psychology, 1948 (1983)*

Beck, Michael E., B.S. Upper Iowa 1976, D.D.S. Iowa 1980; *adjunct assistant professor, Family Dentistry, 1986*

Beck, Ronald R., B.S. Iowa 1969, M.S. 1970, Ph.D. 1972; *adjunct associate professor, Mechanical Engineering, 1982*

Becker, Samuel L., B.A. Iowa 1947, M.A. 1949, Ph.D. 1953; *University of Iowa Foundation professor, Communication Studies, 1950 (1961)*

Beckermann, Christoph, M.S. Purdue 1984, Ph.D. 1987; *assistant professor, Mechanical Engineering, 1988*

Beddow, John K., B.Sc., A.M.C.T. Manchester (England) 1954, Ph.D. Cambridge (England) 1959; *professor, Chemical and Biochemical Engineering, 1968 (1979)*

Bedell, George N., B.A. DePauw 1944, M.D. Cincinnati 1946; *professor, Internal Medicine, 1952 (1968)*

Bedrossian, Carlos W., B.S. Colegio Moura Lacerda (Brazil) 1961, M.D. Sao Paulo (Brazil) 1967; *professor, Pathology, 1989*

Beeghly, James H. L., B.S. West Virginia 1972, M.D. 1978; *clinical assistant professor, Psychiatry, 1985 (1989)*

Begley, Wayne E., B.A. Louisville 1958, M.F.A. Iowa 1962, Ph.D. Pennsylvania 1966; *professor, School of Art and Art History, 1966 (1980)*

Beguin, Everett A., Jr., B.A. Beloit 1961, M.D. Wisconsin 1966; *clinical instructor, Obstetrics and Gynecology, 1982*

Behning, Monica R., B.S.N. Iowa 1982, M.A. 1987; *adjunct instructor, Nursing, 1988*

Behrendt, Douglas M., A.B. Amherst 1959, M.D. Harvard 1963; *professor, Surgery, 1986*

Behrens, Joan E., B.S.N. Iowa 1960, M.A. New York 1974; *adjunct instructor, Nursing, 1982*

Belair, Arthur, B.A. Park College 1976, M.A. Northern Colorado 1980, B.S. Buena Vista 1984; *assistant professor, Aerospace Military Studies, 1984*

Belgum, David R., B.A. Minnesota 1944, B.D. Northwestern Lutheran Theological Seminary 1946, Ph.D. Boston 1952; *professor emeritus, School of Religion/Internal Medicine, 1964 (1987)*

Bell, Colin E., B.A. California (Berkeley) 1964, M.A. 1966, Ph.D. Yale 1969; *professor, Management Sciences, 1980*

Bell, Edward F., B.A. Washington and Jefferson 1969, M.D. Columbia 1973; *professor, Pediatrics, 1979 (1988)*

Bell, Marvin H., B.A. Alfred 1958, M.A. Chicago 1961, M.F.A. Iowa 1963; *Flannery O'Connor professor of Letters, English, 1965 (1975)*

Bell, William E., A.B. West Virginia 1951, M.S. 1951, M.S. 1953, M.D. Virginia 1955; *professor, Pediatrics/Neurology, 1962 (1972)*

Beller, Fritz K., M.D. Philipps (West Germany) 1948, Dr. med. 1949, Dr. s.c.med. Liebig 1955 *William C. Keettel professor, Obstetrics and Gynecology, 1988*

Beltramo, Louise, B.A. Louisiana State 1941, M.A. Iowa 1949, Ph.D. 1954; *professor, Curriculum and Instruction, 1954 (1966)*

Benda, Evelyn J., B.S.N. Iowa 1973, M.A. 1975, Ph.D. 1989; *adjunct assistant professor, Nursing, 1989*

Benda, Jo Ann, B.S. Iowa State 1971, M.D. Iowa 1975; *associate professor, Pathology/Obstetrics and Gynecology, 1979 (1988)*

Benda, Thomas J., B.A. Loras 1950, M.D. Iowa 1953; *clinical associate professor, Otolaryngology-Head and Neck Surgery, 1978*

Bennett, John R., B.A. Occidental 1964, M.S.J. Northwestern 1968; *assistant professor, School of Journalism and Mass Communication, 1978*

Bennett, William E., B.S. Sterling 1947, Ph.D. Kansas 1951; *associate professor, Chemistry, 1953 (1959)*

Bentler, Ruth A., B.S. Iowa 1971, M.A. 1973, Ph.D. 1987; *assistant professor, Speech Pathology and Audiology, 1977 (1988)*

Benton, Arthur L., B.A. Oberlin 1931, M.A. 1933, Ph.D. Columbia 1935; *professor emeritus, Psychology/Neurology, 1948 (1978)*

Bentz, Dale M., B.A. Gettysburg 1939, B.S.L.S. North Carolina 1940, M.S. Illinois 1951; *professor emeritus, School of Library and Information Science, 1953 (1986)*

Benz, Gladys, B.S. Columbia 1931, M.A. Michigan State 1940; *associate professor emeritus, Nursing, 1956 (1964)*

Benz, Loretta B.A. Iowa 1972, M.S.W. 1973; *adjunct instructor, School of Social Work, 1988*

Berardi, Romeo S., B.S. Boston (Chestnut Hill) 1952, M.S. 1953, M.D. Rome (Italy) 1958; *clinical associate professor, Surgery, 1974*

Berbaum, Kevin S., B.A. Millikin 1971, Ph.D. State University of New York 1978; *adjunct associate professor, Radiology, 1989*

Berc, Shelley G., B.A. Amherst 1979, M.F.A. Yale 1983; *associate professor, Theatre Arts, 1985 (1989)*

Berg, Clarence P., B.A. Augustana 1924, M.A. Illinois 1925, Ph.D. 1929, LL.D. Augustana 1960; *professor emeritus, Biochemistry, 1929 (1968)*

Berg, John W., B.S. Yale 1948, M.D. 1951; *adjunct professor, Preventive Medicine and Environmental Health, 1973 (1977)*

Berg, Mary J., B.S.Ph. North Dakota State 1974, Pharm.D. Kentucky 1978; *associate professor, Pharmacy, 1980 (1985)*

Berger-Wesley, Mary S., B.S.N. Coe 1977, M.S. Arizona 1983; *adjunct instructor, Nursing, 1984*

Bergman, Ronald A., B.S. Illinois 1950, M.S. 1953, Ph.D. 1955; *professor, Anatomy, 1980*

Berkey, David M., B.A. Wisconsin (Stevens Point) 1973, M.A. California (Los Angeles) 1976; *associate professor, Dance, 1984 (1989)*

Berkowitz, Daniel A., B.S. Humboldt State 1975, M.S. Oregon 1985, Ph.D. Indiana 1988; *assistant professor, School of Journalism and Mass Communication, 1988*

Berman, Constance A. H., B.A. Carleton 1970, M.A. Wisconsin (Madison) 1972, Ph.D. 1978; *assistant professor, History, 1988*

Bernhard, David H., B.S. Iowa 1970; *adjunct instructor, Pharmacy, 1978*

Berry, Clyde M., B.S. McKendree 1933, M.S. Illinois 1936, M.S. Iowa 1940, Ph.D. 1941; *professor emeritus, Preventive Medicine and Environmental Health/Civil and Environmental Engineering, 1955 (1982)*

Bertocci, Angelo P., A.B. Boston 1927, A.M. Harvard 1928, Diplome Grenoble (France) 1930, Ph.D. Columbia 1947; *professor emeritus, English/Comparative Literature, 1966 (1975)*

Bertolatus, John A., B.A. Johns Hopkins 1972, M.D. 1976; *assistant professor, Internal Medicine, 1982 (1984)*

Betterley, Melvin L., B.S. Stout 1932, M.A. Minnesota 1939; *professor emeritus, Industrial and Management Engineering, 1952 (1978)*

Betts, Carl E., B.A. Iowa 1951, M.A. 1957, Ph.D. 1963; *adjunct associate professor emeritus, Pediatrics/Speech Pathology and Audiology/Otolaryngology-Head and Neck Surgery, 1970 (1989)*

Bezanson, Randall P., B.S. Northwestern 1968, J.D. Iowa 1971; *professor, Law, 1973 (1979)*

Bhalla, Ramesh C., B.V.Sc. Panjab (India) 1957, F.R.V.C.S. Stockholm (Sweden) 1962, Ph.D. Wisconsin 1970; *professor, Anatomy, 1973 (1982)*

Bhatnagar, Ranbir K., B.S. Lucknow (India) 1954, B.V.S. Agra (India) 1958, M.S. Michigan State 1963, Ph.D. 1971; *professor, Pharmacology, 1971 (1981)*

Bhatti, M. Asghar, B.E. Karachi (Pakistan) 1972, M.S. California (Berkeley) 1975, Ph.D. 1980; *associate professor, Civil and Environmental Engineering/ Mechanical Engineering, 1980 (1985)*

Bierbaum, Esther G., B.A. Meredith 1949, M.A. Florida 1952, Ph.D. North Carolina 1982; *associate professor, School of Library and Information Science, 1983 (1988)*

Bigelow, Harold F., D.D.S. Iowa 1968, M.S. 1972; *adjunct assistant professor, Orthodontics, 1985*

Biller, José, B.S.A.V. Acededo Institute (Uruguay) 1966, M.D. University of the Republic (Uruguay) 1974; *professor, Neurology, 1984 (1990)*

Bills, David B., B.A. Edinboro State 1975, M.S. Wisconsin (Madison) 1977, Ph.D. 1981; *associate professor, Planning, Policy and Leadership Studies, 1985 (1989)*

Birch, Eleanor M., A.B. Brown 1949, Ph.D. Iowa 1969; *associate professor, Management Sciences, 1968 (1975)*

Birch, John J., Sc.B. Brown 1950, Ph.D. California (Berkeley) 1960; *associate professor emeritus, Statistics and Actuarial Science, 1964 (1988)*

Birnbaum, Raoul, B.A. City College of New York 1971, M.A. Columbia 1973, M.Phil 1975, Ph.D. 1976; *assistant professor, School of Religion, 1989*

Birrell, Susan J., B.A. St. Lawrence 1968, M.S. Massachusetts 1976, Ph.D. 1978; *associate professor, Physical Education and Sports Studies, 1980 (1984)*

Bishara, Samir E., B.D.S. Alexandria (Egypt) 1957, D. Orth. Certif. 1967, M.S. Iowa 1970, D.D.S. Iowa 1972; *professor, Orthodontics, 1970 (1976)*

Bishop, Gail A., B.A. St. Olaf 1977, M.S. Wisconsin (Madison) 1979, Ph.D. Michigan (Ann Arbor) 1983; *assistant professor, Microbiology, 1989*

Bixler, John W., B.A. Goshen, M.A. Iowa; *adjunct professor, School of Music, 1979*

Bjorndal, Arne Magne, L.D.S. Norges Tannlegehogskle (Norway) 1947, D.D.S. Iowa 1954, M.S. 1956; *professor emeritus, Endodontics, 1955 (1984)*

Black, Donald W., B.A. Stanford 1978, M.D. Utah 1982; *assistant professor, Psychiatry, 1986*

Black, Harold J., B.S. Iowa 1953, M.S. 1955; *assistant professor, Pharmacy, 1955 (1965)*

Blaha, David B., B.S. Iowa 1970, D.D.S. 1974; *adjunct assistant professor, Pediatric Dentistry, 1989*

Blair, Donald W., B.S. Iowa 1942, M.D. 1944; *clinical assistant professor, Orthopaedic Surgery, 1982*

Blair, William F., B.A. Northern Iowa 1970, M.D. Iowa 1974; *professor, Orthopaedic Surgery, 1980 (1988)*

Blegen, Mary A., B.S.N. Augustana 1966, M.A. Iowa 1975, Ph.D. 1987; *assistant professor, Nursing, 1978 (1987)*

Blew, Robert E., D.D.S. Loyola 1974; *adjunct assistant professor, Family Dentistry, 1986*

Block, Robert I., B.A. Shimer 1969, M.S. Harvard 1972, M.S. Rutgers 1977, Ph.D. 1981; *assistant professor, Anesthesia, 1988*

Blodi, Christopher F., B.A. Iowa 1975, B.S. 1975, M.D. Washington (Missouri) 1979; *assistant professor, Ophthalmology, 1985*

Blodi, Frederick C., M.D. Vienna (Austria) 1940; *professor emeritus, Ophthalmology, 1952 (1987)*

Bloesch, Richard J., B.A. Elmhurst 1952, M.Div. Union Theological Seminary 1955, S.M.M. 1959, D.M.A. Illinois 1971; *associate professor, School of Music, 1967 (1974)*

Bloomberg, Robert, B.F.A. Chicago 1962, M.S.W. Smith 1970; *adjunct instructor, School of Social Work, 1988*

Blum, Cinzia, M.A. Iowa 1985, Ph.D. Cornell 1989; *assistant professor, French and Italian, 1989*

Boardman, Deborah M., B.A. Mount Holyoke 1981, B.F.A. Massachusetts 1984, M.F.A. Tufts 1987; *assistant professor, School of Art and Art History, 1989*

Boatwright, Barbara, B.A. Louisville 1945, M.S.W. Pittsburgh 1949; *adjunct instructor, School of Social Work, 1984*

Boe, Warren J., B.A. Luther 1960, M.S. Iowa State 1964, Ph.D. Purdue 1970; *associate professor, Management Sciences, 1970 (1975)*

Boeder, Paul, M.A. Pennsylvania 1926, Ph.D. Gottingen 1931; *professor emeritus, Ophthalmology, 1957 (1971)*

Boersma, Wendell C., B.A. Hope 1948, M.A. Western Michigan 1958, Ph.D. Michigan 1967; *adjunct professor emeritus, Planning, Policy and Leadership Studies, 1967 (1990)*

Boggess, Thomas F., Jr. B.S. Lamar 1978, M.S. North Texas State 1980, Ph.D. 1982; *associate professor, Laser Science and Engineering, 1989*

Boire, Paula L., B.M. Oberlin 1972, M.M. Houston 1973, Dipl. Hochscule fur Musik (Austria) 1977, A.Mus.D. Arizona 1984; *assistant professor, School of Music, 1985*

Bolden, Aljernon J., B.A. Boston 1973, D.M.D. Tufts 1976, M.P.H. Harvard 1980; *assistant professor, Preventive and Community Dentistry, 1990*

Bollen, Bruce A., B.S. California (Davis) 1978, M.D. University of Southern California 1982; *assistant professor, Anesthesia, 1989*

Bonfield, Arthur E., B.A. Brooklyn 1956, J.D. Yale 1960, LL.M. 1961; *John F. Murray professor, Law, 1962 (1966)*

Bonfiglio, Michael, A.B. Columbia 1940, M.D. Chicago 1943; *professor emeritus, Orthopaedic Surgery, 1950 (1987)*

Bonney, William W., A.B. Whittier 1953, M.D. California (Los Angeles) 1961; *associate professor, Urology, 1969 (1973)*

Bonsib, Stephen M., B.A. Indiana 1972, M.S. 1976, M.D. 1978; *associate professor, Pathology, 1982 (1987)*

Boos, Florence, B.A. Michigan 1964, A.M. Harvard 1965, Ph.D. Wisconsin 1972; *professor, English, 1973 (1982)*

Borreca, Arthur E., B.A. Oberlin 1981, M.F.A. Yale 1986; *assistant professor, Theatre Arts, 1989*

Bosch, E. Peter, Matura Bundesrealgymnasium Fuersten Feld (Austria) 1963, M.D. Innsbruck (Austria) 1969; *professor, Neurology, 1974 (1987)*

Bottles, Kent, A.B. California (Berkeley) 1973, M.D. Case Western Reserve 1980; *associate professor, Pathology, 1989*

Boulware, Lois, B.A. Culver-Stockton 1926, M.A. Iowa 1932, M.D. 1937; *assistant professor emeritus, Preventive Medicine and Environmental Health, 1938 (1971)*

Bourgeacq, Jacques A., M.A. St. Louis 1965, Ph.D. Iowa 1972; *professor, French and Italian, 1969 (1982)*

Bovbjerg, Richard V., B.S. Chicago 1941, Ph.D. 1949; *professor emeritus, Biology, 1955 (1989)*

Bovenmyer, Dan A., M.D. Iowa 1956; *clinical assistant professor, Dermatology, 1981*

Bowers, John M., B.S. Duke 1981, M.A. South Dakota 1988; *assistant professor, Aerospace Military Studies, 1989*

Bowers, Wayne A., B.A. Wisconsin (Oshkosh) 1974, M.S. 1976, Ph.D. Iowa 1987; *adjunct assistant professor, Psychiatry, 1988*

Boyd, Willard L., B.S.L. Minnesota 1949, LL.B. 1951, LL.M. Michigan 1952, S.J.D. 1962; *professor, Law, 1954 (1961)*

Boyer, Daniel B., B.A. Iowa 1966, D.D.S. 1970, Ph.D. Polytechnic Institute 1974; *professor, Operative Dentistry, 1974 (1988)*

Boyer, E. Marcia, B.S. Iowa 1967, M.S. 1969, M.Phil. Columbia 1974, Ph.D. 1980; *clinical assistant professor, Preventive and Community Dentistry, 1974 (1983)*

Boyle, Don E., B.S. Iowa 1956, M.D. 1963, M.S. 1968; *clinical assistant professor, Surgery, 1978*

Boyle, John P., B.A. St. Ambrose 1953, S.T.B. Gregorian (Italy) 1955, S.T.L. 1957, Ph.D. Fordham 1972; *associate professor, School of Religion, 1972 (1977)*

Boyle, Mary B., A.B. Barnard 1976, Ph.D. Yale 1983; *assistant professor, Physiology and Biophysics, 1988*

Boynton, George R., B.A. Oklahoma Baptist 1957, Ph.D. North Carolina 1964; *professor, Political Science, 1964 (1971)*

Boysen, James F., B.S. Minnesota 1946, B.M. 1947, M.D. 1948; *clinical assistant professor, Pediatrics, 1976*

Boysen, Thomas C., B.A. St. Olaf 1979, M.D. Iowa 1984; *clinical assistant professor, Dermatology, 1988*

Bozeman, T. Dwight, B.A. Florida Presbyterian 1964, B.D. Union Theological Seminary 1968, Th.M. 1970, Ph.D. Duke 1974; *professor, School of Religion/History, 1974 (1987)*

Bradbury, James T., B.S. Montana State 1928, M.S. Michigan 1930, Sc.D. 1932; *professor emeritus, Obstetrics and Gynecology, 1952 (1974)*

Bradke, Margaret, B.S.N. Mount Mercy 1976, M.A. Iowa 1982; *adjunct instructor, Nursing, 1986*

Braley, Alson E., M.D. Iowa 1931; *professor emeritus, Ophthalmology, 1950 (1969)*

Brand, Richard A., A.B. Oklahoma State 1963, M.D. Baylor 1967; *professor, Orthopaedic Surgery/Biomedical Engineering/Mechanical Engineering, 1974 (1982)*

Brandtner, Alex J., B.S. William Penn 1977, D.D.S. Iowa 1981; *adjunct assistant professor, Pediatric Dentistry, 1989*

Branson, Dan E., B.C.E. Auburn 1954, M.C.E. 1956, Ph.D. Florida 1960; *professor, Civil and Environmental Engineering, 1963*

Branson, Thomas P., B.A. Chicago 1975, M.S. 1975, Ph.D. Massachusetts Institute of Technology 1979; *professor, Mathematics, 1985 (1990)*

Brass, Margaret N., B.A. Valparaiso 1965, M.A.Iowa 1975; *adjunct instructor, School of Social Work, 1984*

Bratton, Barry D., B.A. Juniata 1966, M.A. Pittsburgh 1969, Ph.D. Michigan State 1975; *associate professor, Psychological and Quantitative Foundations, 1975 (1981)*

Bravo, Ramiro, B.S. San Andres (Bolivia) 1979, M.S. Iowa 1987; *adjunct instructor, Mechanical Engineering, 1989*

Breder, Hans, *professor, School of Art and Art History, 1966 (1979)*

Brennan, Robert L., B.A. State College at Salem (Massachusetts) 1967, M.A.T. Harvard 1968, Ph.D. 1970; *adjunct assistant professor, Psychological and Quantitative Foundations, 1979*

Brenner, Robert L., B.S. City University of New York 1963, M.S. Montana 1964, Ph.D. Missouri 1973; *associate professor, Geology, 1977 (1982)*

Brenton, Douglas W., B.A. Duke 1970, M.D. Iowa 1974; *clinical assistant professor, Neurology, 1982*

Bricker, Dennis L., B.S. Illinois 1965, M.S. 1966, M.S. Northwestern 1972, Ph.D. 1975; *associate professor, Industrial and Management Engineering, 1974 (1980)*

Brine, Pauline F., B.S. Boston 1954, M.P.H. North Carolina 1958, C.A.G.S. Boston 1964; *associate professor, Dental Hygiene, 1964 (1971)*

Brink, Pamela J., B.S. St. Mary's (Los Angeles) 1956, M.S.N. Catholic 1959, Ph.D. Boston University 1969; *adjunct professor, Nursing, 1982 (1988)*

Britigan, Bradley E., B.A. Cornell (New York) 1976, M.D. Southern California 1980; *assistant professor, Internal Medicine, 1987*

Brody, Michael J., B.S. Columbia 1956, Ph.D. Michigan 1961; *professor, Pharmacology, 1961 (1969)*

Broffitt, James D., B.A. DePauw 1963, M.S. Colorado State 1965, Ph.D. 1969; *Principal Financial Group professor, Statistics and Actuarial Science, 1970 (1988)*

Broman, Kay F., B.S.N. Iowa 1976, M.B.A. 1986; *adjunct instructor, Nursing, 1987*

Brooks, Michael S., B.S. California-Davis 1977, M.D. Loyola 1980; *clinical assistant professor, Internal Medicine, 1986*

Brotherton, Timothy W., B.A. Johns Hopkins 1975, Ph.D. McMaster 1978, M.D. Iowa 1982; *assistant professor, Internal Medicine, 1987*

Brown, Alicia A., B.A. George Washington 1972, M.A. Iowa 1976; *associate professor, Dance, 1976 (1982)*

Brown, Carolyn J., B.S. Eastern New Mexico 1976, M.S. 1977, Ph.D. Iowa 1981; *adjunct assistant professor, Speech Pathology and Audiology, 1983*

Brown, Donald D., B.A. Iowa 1962, M.S. 1965, M.D. 1966; *associate professor, Internal Medicine, 1973 (1978)*

Brown, James C. N., M.B.B.Ch. National University of Ireland 1960, M.S. Iowa 1964; *clinical associate professor, Psychiatry, 1970 (1985)*

Brown, Joseph D., B.A. Iowa 1955, M.D. 1958; *associate professor, Internal Medicine, 1962 (1969)*

Brown, Louis F., B.A. Coe 1950, M.A. Iowa 1952, Ph.D. 1961; *associate professor emeritus, Curriculum and Instruction, 1964 (1987)*

Brown, Robert C., B.S. Portland 1946, M.D. Loyola (Chicago) 1948; *professor emeritus, Radiology, 1968 (1990)*

Brown, Thomas D., B.S. Maryland 1972, Ph.D. Carnegie-Mellon 1976; *professor, Orthopaedic Surgery/Biomedical Engineering/ Mechanical Engineering, 1983 (1987)*

Brown, Thomas M., Jr., B.S. Vanderbilt 1965, M.D. 1969; *clinical assistant professor, Internal Medicine, 1980*

Brubaker, Larry, B.A. Drake 1960, M.A. Iowa 1964; *adjunct instructor, School of Social Work, 1988*

Bruch, Delores R., B.S.Ed. Central Missouri 1956, M.M. Missouri (Kansas City) 1969, D.M.A. Kansas 1979; *professor, School of Music, 1979 (1987)*

Bruell, Steven C., B.A. Texas (Austin) 1973, M.S. Purdue 1975, Ph.D. 1978; *associate professor, Computer Science, 1985*

Buchanan, Edward B. Jr., B.S. Detroit 1950, M.S. 1954, Ph.D. Iowa State 1959; *professor, Chemistry, 1960 (1982)*

Buck, Dorryl L., Jr., B.S. Iowa 1966, M.D. 1970; *clinical assistant professor, Pathology, 1978*

Buck, James R., B.S. Michigan Technological 1952, M.S. 1953, Ph.D. Michigan 1964; *professor, Industrial and Management Engineering, 1980*

Buckles, Robert E., B.S. California (Berkeley) 1939, M.S. 1940, Ph.D. California (Los Angeles) 1942; *professor emeritus, Chemistry, 1945 (1984)*

Buckley, Michael J., B.A. Holy Cross, M.S. Connecticut 1979, D.M.D. 1983; *assistant professor, Oral and Maxillofacial Surgery, 1988*

Buckley, Susan C., B.A. SUNY-Cortland 1972, M.S. Purdue 1974; *adjunct instructor, School of Social Work, 1987*

Buckwalter, Joseph, B.A. Iowa 1969, M.S. 1972, M.D. 1974; *professor, Orthopaedic Surgery, 1979 (1985)*

Buckwalter, Kathleen, B.S.N. Iowa 1971, M.A. 1976, Ph.D. Illinois 1980; *professor, Nursing, 1974 (1989)*

Budd, Ann F., B.A. Lawrence 1973, M.S. Johns Hopkins 1975, Ph.D. 1978; *associate professor, Geology, 1978 (1989)*

Budreau, Ginette K., B.S.N. Marycrest 1978, M.A. Iowa 1987; *adjunct instructor, Nursing, 1988*

Bulechek, Gloria, B.S.N. Iowa 1963, M.A. 1967, Ph.D. 1981; *assistant professor, Nursing, 1963 (1970)*

Bunge, Raymond G., B.A. Michigan 1932, M.D. 1936; *professor emeritus, Urology, 1941 (1976)*

Burford, Byron L., Jr., B.F.A. Iowa 1942, M.F.A. 1947; *professor emeritus, School of Art and Art History, 1949 (1985)*

Burkart, Michael R., B.S. Wisconsin 1964, M.S. Northern Illinois 1969, Ph.D. Iowa 1976; *adjunct assistant professor, Geology 1985*

Burke, Mary K., B.A. St.Mary's (Indiana) 1975, M.F.A. Ohio 1977; *assistant professor, Theatre Arts, 1986*

Burke, N. Peggy, B.A. Morehead State 1956, M.A. 1957, Ph.D. Iowa 1965; *associate professor, Physical Education and Sports Studies, 1964 (1978)*

Burman, Arthur C., A.B. Denver 1949, M.A. 1952, Ed.D. Indiana 1959; *professor, Planning, Policy and Leadership Studies, 1970*

Burmeister, Leon F., B.S. Iowa State 1964, M.S. 1966, Ph.D. 1972; *professor, Preventive Medicine and Environmental Health, 1969 (1982)*

Burnham, Frederick C., D.M.D. Southern Illinois 1977; *adjunct assistant professor, Family Dentistry, 1986*

Burns, C. Patrick, B.A. Kansas 1959, M.D. 1963; *professor, Internal Medicine, 1971 (1980)*

Burns, Elizabeth A., B.S. Marygrove College 1972, M.D. Michigan 1976, M.A. Iowa 1981; *associate professor, Family Practice, 1981 (1986)*

Burns, Linda J., B.S. Missouri (Columbia) 1976, M.D. 1981; *assistant professor, Internal Medicine, 1988 (1989)*

Burns, Trudy L., B.A. Oakland 1973, M.P.H. Michigan 1976, Ph.D. 1982; *associate professor, Preventive Medicine and Environmental Health, 1982 (1987)*

Burton, Donald J., B.S. Loyola (Maryland) 1956, Ph.D. Cornell 1961; *Carver/Ralph L. Shriner professor, Chemistry, 1962 (1989)*

Burton, Steven J., B.A. California 1970, J.D. Southern California 1973; *professor, Law, 1977 (1981)*

Buss, William G., B.A. Yale 1955, LL.B. Harvard 1960; *Odis K. Patton professor, Law, 1967 (1970)*

Busse, Geraldine, B.S. Iowa 1940, G.N. Certificate 1940, M.P.H. Minnesota 1952; *associate professor emeritus, Nursing, 1969 (1983)*

Butchvarov, Panayot, B.A. Robert (Turkey) 1952, M.A. Virginia 1954, Ph.D. 1955; *professor, Philosophy, 1967*

Butler, Audrey A., B.S. Iowa 1984, Ph.D. 1989; *adjunct assistant professor, Chemical and Biochemical Engineering, 1989*

Butler, C. David, B.S.Pharm. Houston 1977, Pharm.D. Tennessee (Memphis) 1980; *clinical assistant professor, Pharmacy, 1986*

Butler, John E., B.S. Wisconsin State 1961, Ph.D. Kansas 1966; *professor, Microbiology, 1971 (1980)*

Butler, P. Barry, B.S. Illinois 1979, M.S. 1981, Ph.D. 1984; *associate professor, Mechanical Engineering, 1984 (1989)*

Bzdega, Holley A., B.S. Cornell (New York) 1974, M.D. Manitoba (Canada) 1978; *clinical assistant professor, Pediatrics, 1987*

Cac, Nguyen P., Licence es Sc. Saigon (Vietnam) 1958, M.S. London (England) 1961, Ph.D. Cambridge (England) 1965; *professor, Mathematics, 1968 (1972)*

Cadoret, Remi J., A.B. Harvard 1949, M.D. Yale 1953; *professor, Psychiatry, 1973*

Caln, George D., B.S. Sterling 1962, M.S. Purdue 1964, Ph.D. 1968; *professor, Biology, 1970 (1984)*

Calloway, Ruth Ann, *clinical assistant professor, Pharmacy, 1984*

Calvert, Wynne, B.S. Montana State 1958, M.S. Wisconsin 1959, Ph.D. Colorado 1962; *adjunct professor, Physics and Astronomy, 1989*

Calvin, James A., B.S. Oregon 1976, M.S. Colorado State 1980, Ph.D. 1985; *assistant professor, Statistics and Actuarial Science/ Preventive Medicine and Environmental Health, 1985*

Camillo, Victor P., Jr., B.A. Bridgeport 1966, Ph.D. Rutgers 1969; *professor, Mathematics, 1970 (1979)*

Campbell, Kathryn S., A.B. Kansas 1962, M.A. 1964, Ph.D. Illinois 1973; *adjunct associate professor, English, 1975 (1981)*

Campbell, Kevin P., B.S. Manhattan 1973, M.S. Rochester 1976, Ph.D. 1979; *University of Iowa Foundation professor, Physiology and Biophysics, 1981 (1988)*

Cannon, Joseph G., B.S. Illinois 1951, M.S. 1953, Ph.D. 1956; *professor, Pharmacy, 1962 (1965)*

Canter, Arthur, B.A. Iowa 1946, M.A. 1948, Ph.D. 1950; *professor emeritus, Psychiatry, 1960 (1986)*

Cantor, Gordon N., B.A. Syracuse 1950, M.A. 1951, Ph.D. Iowa 1954; *professor emeritus, Psychological and Quantitative Foundations, 1960 (1989)*

Cantor, Joan H., B.A. Syracuse 1951, M.A. Iowa 1953, Ph.D. 1954; *professor, Psychology, 1960 (1979)*

Caplan, Richard M., B.S. Iowa State 1949, M.A. Iowa 1951, M.D. 1955; *professor, Dermatology, 1961 (1969)*

Caplan, Robert H., B.S. Purdue 1958, M.D. Chicago 1961; *clinical associate professor, Internal Medicine, 1988 (1990)*

Carew, David P., B.S. Massachusetts College of Pharmacy 1952, M.S. 1954, Ph.D. Connecticut 1958; *professor, Pharmacy, 1957 (1965)*

Carlsen, George R., B.A. Minnesota 1938, B.S. 1940, M.A. 1944, Ph.D. 1948; *professor emeritus, English/Secondary Education, 1958 (1982)*

Carlson, Barbara B., B.S.N. Mary Washington 1964, M.A. Iowa 1971; *adjunct instructor, Nursing, 1984*

Carlson, David E., B.S. Iowa 1966, M.S. 1970; *adjunct assistant professor, Pharmacy, 1977*

Carlson, Jonathan C., B.A. McGill 1976, J.D. Chicago 1979; *professor, Law, 1983 (1987)*

Carlson, Richard R., Ph.B. Chicago 1943, B.S. 1945, M.S. 1949, Ph.D. 1951; *professor, Physics and Astronomy, 1951 (1963)*

Carlson, Wayne R., B.A. Rockford 1962, M.A. Indiana 1966, Ph.D. 1968; *associate professor, Botany, 1968 (1973)*

Carmichael, Gregory R., B.S. Iowa State 1974, M.S. Kentucky 1975, Ph.D. 1979; *professor, Chemical and Biochemical Engineering,1978 (1985)*

Carmichael, Jocelyn S., B.M. Eastman School of Music 1959, M.M. Nebraska 1962, Diplome in Oper Hochschule Mozarteum (Austria) 1972, Diplome in Lied 1973; *professor, School of Music, 1978 (1990)*

Carmichael, Robert S., B.A.Sc. Toronto 1963, M.S. Pittsburgh 1964, Ph.D. 1967; *professor, Geology, 1977 (1983)*

Caropreso, Philip R., B.A. Seton Hall 1968, M.D. Upstate Medical 1972; *clinical assistant professor, Surgery, 1987*

Carpenter, Martha A., A.B. Albright 1954, M.S. Bridgeport 1963, B.S.N. Iowa 1979, M.A. 1983, Ph.D. 1988; *assistant professor, Nursing, 1988*

Carpenter, Raymon T., B.S. Kansas 1954, M.S. 1956, Ph.D. Northwestern 1962; *professor, Physics and Astronomy, 1962 (1983)*

Carrillo, Pedro M., B.S. Iowa 1981, Pharm.D. 1987; *adjunct assistant professor, Pharmacy, 1990*

Carroll, Thomas J., B.B.A. Notre Dame 1979, Ph.D. Michigan (Ann Arbor) 1988; *assistant professor, Accounting, 1988*

Carter, James G., B.A. Iowa 1948, M.D. 1952; *associate professor emeritus, Anesthesia, 1977 (1989)*

Carter, Keith D., B.S. Purdue 1979, M.D. Indiana 1983; *assistant professor, Ophthalmology, 1988*

Cary, Richard T., B.S. North Carolina State 1971, M.S. 1973, Ph.D. Purdue 1976; *associate professor, Home Economics, 1981 (1984)*

Casady, Donald Rex, B.S.P.E. Iowa 1950, M.A. 1955, Ph.D. 1959; *professor, Exercise Science, 1958 (1969)*

Casale, Thomas B., B.S. Illinois (Chicago) 1973, M.D. Chicago Medical School 1977; *associate professor, Internal Medicine, 1984 (1989)*

Casavant, Thomas L., B.S. Iowa 1982, M.S. 1983, Ph.D. 1986; *assistant professor, Electrical and Computer Engineering, 1986 (1989)*

Casey, Rita Jane, B.S. Carleton 1975, B.S. Texas (Tyler) 1975, M.A. 1977, Ph.D. Texas (Austin) 1988; *assistant professor, Psychology, 1987 (1988)*

Casko, John S., B.S. Holy Cross 1960, D.D.S. Georgetown 1964, M.S. 1968, Ph.D. Pittsburgh 1970; *professor, Orthodontics, 1976*

Cassell, Martin D., B.S. Bristol (England) 1976, Ph.D. 1980; *associate professor, Anatomy, 1982 (1989)*

Casteel, Dee Ann, B.Mus. Coe 1979, Ph.D. Illinois 1985; *assistant professor, Pharmacy, 1987*

Catalano, Cosmo A., B.A. Allegheny 1950, M.F.A. Yale 1953; *professor, Theatre Arts, 1966 (1975)*

Cater, E. David, B.S. Trinity 1954, Ph.D. Kansas 1960; *professor, Chemistry, 1961 (1979)*

Catney, Michael R., B.S.N. Southern Illinois 1975, M.A. Iowa 1982; *adjunct instructor, Nursing, 1984*

Caudill, George G., M.D. Iowa 1952; *clinical assistant professor, Pediatrics, 1975*

Cayner, Jay J., B.S. Wisconsin (Stevens Point) 1971, M.S.S.W. Wisconsin (Madison) 1976; *adjunct instructor, School of Social Work, 1984*

Cazin, John, Jr., B.S. North Carolina 1952, M.S. 1954, Ph.D. 1957; *professor, Microbiology, 1957 (1972)*

Ceilley, Roger Ivan, B.A. University of Northern Iowa 1967, M.D. Iowa 1971; *clinical assistant professor, Dermatology, 1976 (1979)*

Cerreta, Florindo V., B.A. Fordham 1943, M.A. Columbia 1947, Ph.D. 1954; *professor emeritus, French and Italian, 1957 (1986)*

Chadima, Helen L., B.A. Iowa 1949, M.A. 1981; *associate professor, Dance, 1983 (1990)*

Chalkley, Yvonne M., B.S. Iowa 1973, D.D.S. 1977, M.S. 1979; *associate professor, Operative Dentistry, 1977 (1984)*

Chamallas, Martha E., B.A. Tufts 1971, J.D. Louisiana State 1975; *professor, Law, 1981 (1984)*

Chamberlain, David S., B.A. Dartmouth 1952, M.A. Oxford (England) 1958, Ph.D. Princeton 1966; *professor, English, 1961 (1975)*

Chambers, George A., B.A. Northern Iowa 1954, M.A. 1958, Ph.D. Iowa 1964; *professor, Planning, Policy and Leadership Studies, 1963 (1970)*

Chametzky, Robert A., B.A. Columbia 1979, Ph.D. Chicago 1987; *assistant professor, Linguistics, 1988*

Champion, M. Craig, B.S. Iowa State 1958, M.D. Iowa 1962; *clinical associate professor, Internal Medicine, 1969 (1983)*

Chan, Bing C., B.A. Chinese University of Hong Kong 1968, M.Ed. Bowling Green 1970, Ph.D. Wisconsin 1980, M.A. 1981; *associate professor, Asian Languages and Literature, 1979 (1987)*

Chan, Kai Chiu, B.S. Asia (Japan) 1958, D.D.S. Tokyo Medical and Dental (Japan) 1962, M.S. Iowa 1964, D.D.S. 1967; *professor, Operative Dentistry, 1964 (1976)*

Chandra, Michael S., B.A. Xavier (Fiji) 1957, D.S.M. Fiji School of Medicine (Fiji) 1963, M.B.B.S. Asam Medical College (India) 1968; *clinical assistant professor, Internal Medicine, 1975 (1979)*

Chandramouli, B., M.B.B.S. Mysore (India) 1960; *clinical assistant professor, Pediatrics, 1971 (1976)*

Chandran, Krishnan B., B.S. American (India) 1963, B. Tech. Indian Institute of Technology 1966, M.S. Washington (Missouri) 1969, D.Sc. 1972; *professor, Biomedical Engineering/ Mechanical Engineering, 1978 (1984)*

Chandran, Prem K. G., M.B.B.S. Kerala (India) 1987; *clinical instructor, Internal Medicine, 1987*

Chapleau, Mark W., B.S. Wisconsin (Whitewater) 1977, Ph.D. Louisiana State 1985; *adjunct assistant professor, Internal Medicine, 1989*

Chapler, Frederick K., B.A. California (Berkeley) 1957, M.D. California (San Francisco) 1960; *professor, Obstetrics and Gynecology, 1970 (1976)*

Chapman, JoAnn, B.S.N. Macalester 1962, M.P.H.A. Minnesota 1985; *adjunct associate professor, Nursing, 1989*

Chappell, David A., B.A. Austin 1975, M.D. Southwestern Medical (Dallas) 1979; *assistant professor, Internal Medicine, 1988*

Charlton, Thomas H., B.A. Toronto 1960, Ph.D. Tulane 1966; *professor, Anthropology, 1967 (1980)*

Chatterjee, Satyajit, B.A. Delhi (India) 1977, M.A. 1981, M.A. Rochester 1985, Ph.D. 1987; *assistant professor, Economics, 1985 (1986)*

Chen, Ching-Jen, Diploma Taipei Institute of Technology (Taiwan) 1957, M.S. Kansas State 1962, Ph.D. Case Institute of Technology 1967; *professor, Mechanical Engineering, 1967 (1977)*

Chen, Lea-Der, B.S. National Taiwan 1974, M.S. Pennsylvania State 1979, Ph.D. 1981; *associate professor, Mechanical Engineering, 1982 (1986)*

Cheng, Frank H., B.S. St. John's (China) 1946, M.S. Tennessee 1950, Ph.D. Indiana 1957; *professor, Radiology, 1964 (1980)*

Cheng, Hsi, B.A. Yenching (China) 1948, M.Litt. Cambridge (England) 1963; *professor emeritus, Asian Languages and Literature/Theatre Arts, 1965 (1988)*

Cherryholmes, Keith L., B.S. Iowa 1968, M.S. 1970, Ph.D. 1981; *adjunct assistant professor, Civil and Environmental Engineering, 1987*

Chestnut, David A., B.A. Samford 1974, M.D. Alabama 1978; *associate professor, Anesthesia/ Obstetrics and Gynecology, 1984 (1988)*

Chibnik, Michael S., A.B. Cornell 1968, M.A. Columbia 1973, Ph.D. 1975; *associate professor, Anthropology, 1978 (1984)*

Chin, Ting-Fong, B.S. National Defense Medical Center (Taiwan) 1951, M.S. Iowa 1960, Ph.D. 1962; *associate professor, Pharmacy, 1963 (1976)*

Choi, Hyeong In, B.S. Seoul 1975, M.A. California (Berkeley) 1979, Ph.D. 1982; *associate professor, Mathematics, 1988*

Choi, Kyung Kook, B.S. Yon Sei (Korea) 1970, M.S. Iowa 1977, Ph.D. 1980; *professor, Mechanical Engineering, 1983 (1990)*

Choi, Won Wung, M.D. Chon-nam (Korea) 1957, D.M.S. Seoul National (Korea) 1966; *associate professor, Anesthesia/Biomedical Engineering, 1979 (1985)*

Choo, Chunghi, B.F.A. Ewha Women's (Korea) 1961, M.F.A. Cranbrook Academy of Art 1965; *professor, School of Art and Art History, 1968 (1981)*

Chowdhury, Salim U., B.Sc. Chittagong (Bangladesh) 1978, M.E. Indian Institute of Science (India) 1981, Ph.D. Southern California 1986; *assistant professor, Electrical and Computer Engineering, 1987*

Chrischilles, Elizabeth A., B.S. Iowa 1979, M.S. 1981, Ph.D. 1986; *assistant professor, Preventive Medicine and Environmental Health, 1982 (1987)*

Christensen, James, B.A. Nebraska (Lincoln) 1953, M.S. Nebraska (Omaha) 1957, M.D. 1957; *professor, Internal Medicine, 1963 (1972)*

Christensen-Szalanski, Carlyn M., A.B. Harvard-Radcliffe 1975, M.D. Washington 1983; *clinical assistant professor, Pediatrics, 1987*

Christensen-Szalanski, Jay J. J., A.B. Harvard 1975, Ph.D. Washington 1978, M.P.H. 1979; *associate professor, Management and Organizations, 1986*

Christiansen, James L., B.S. Michigan State 1977, M.D. Michigan 1981; *assistant professor, Pediatrics, 1988*

Christiansen, Jerry, B.A. Iowa 1968; *adjunct instructor, School of Social Work, 1981*

Chwang, Allen T., B.S. Chu Hai (Hong Kong) 1965, M.S. Saskatchewan (Canada) 1967, Ph.D. California Institute of Technology 1971; *professor, Mechanical Engineering/Civil and Environmental Engineering, 1978 (1981)*

Chyung, Dong H., B.S. Seoul National (Korea) 1959, M.S. Minnesota 1961, Ph.D. 1965; *professor, Electrical and Computer Engineering, 1968 (1973)*

Cintron, Ralph E., B.A. Bard 1970, M.A. Illinois (Chicago) 1980, Ph.D. 1989; *assistant professor, Rhetoric, 1988 (1989)*

Ciochon, Russell L., B.A. California (Berkeley) 1971, M.A. 1974, Ph.D. 1986; *associate professor, Anthropology/Pediatric Dentistry, 1987 (1990)*

Claiborn, Charles D., A.B. Missouri (Columbia) 1973, M.A. Ohio State 1975, Ph.D. Missouri (Columbia) 1978; *professor, Counselor Education/ Psychological and Quantitative Foundations, 1985 (1990)*

Clamon, Gerald H., B.S. Dartmouth 1967, M.D. Washington (Missouri) 1971; *associate professor, Internal Medicine, 1976 (1984)*

Clancy, James M.S., B.S. Iowa 1975, D.D.S. 1978, M.S. 1980; *assistant professor, Prosthodontics, 1986*

Clancy, John, L.M. Coombe Hospital (Ireland) 1947, M.D. University College Dublin (Ireland) 1945, M.B.B.Ch. National (Ireland) 1946; *professor emeritus, Psychiatry, 1959 (1988)*

Clark, Charles R., B.S. Notre Dame 1972, M.D. Michigan 1976; *professor, Orthopaedic Surgery/Biomedical Engineering, 1980 (1988)*

Clark, James N., D.D.S. Iowa 1962, B.S. Loras College 1972; *adjunct assistant professor, Preventive and Community Dentistry, 1990*

Clark, Robert A., A.B. Syracuse 1963, M.D. Columbia 1967; *professor, Internal Medicine, 1983*

Clark, William G., B.A. Iowa 1947, M.A. 1949, Ph.D. Denver 1960; *associate professor emeritus, Rhetoric/English, 1968 (1987)*

Clarke, William R., B.A. Oregon 1964, M.S. Iowa 1967, Ph.D. 1975; *professor, Preventive Medicine and Environmental Health, 1974 (1986)*

Claycamp, Henry G., B.A. Stanford 1974, M.S. Northwestern 1977, Ph.D. 1982; *associate professor, Radiology, 1985 (1990)*

Cleary, T. Anne, B.S. Marquette 1958, M.A. Minnesota 1960, Ph.D. Illinois 1964; *professor, Psychological and Quantitative Foundations, 1979*

Clegg, Steven, B.S. Dundee (Scotland) 1975, Ph.D. 1978; *associate professor, Microbiology, 1980 (1985)*

Clifford, Margaret M., B.S. Alverno 1961, M.S. Wisconsin 1968, Ph.D. 1970; *professor, Psychological and Quantitative Foundations, 1970 (1979)*

Clifton, James A., B.A. Vanderbilt 1944, M.D. 1947; *Roy J. Carver professor, Internal Medicine, 1953 (1963)*

Cline, Hollis T., B.A. Bryn Mawr 1977, Ph.D. California (Berkeley) 1985; *assistant professor, Physiology and Biophysics, 1990*

Clinton, Robert N., A.B. Michigan 1968, J.D. Chicago 1971; *Wylie B. Rutledge professor, Law, 1973 (1979)*

Clow, Toni J., B.S.N. Iowa 1966, M.A. 1975; *associate professor, Nursing, 1976 (1981)*

Cloyed, Ellen, M.S.W. Iowa 1971; *adjunct instructor, School of Social Work, 1982*

Cmiel, Kenneth J., B.A. California (Berkeley) 1977, M.A. Chicago 1978, Ph.D. 1986; *associate professor, History, 1987 (1990)*

Cobb, Deborah S., D.D.S. Iowa 1982; *clinical instructor, Dentistry, 1986*

Coblin, W. South, B.A. Washington 1967, Ph.D. 1972; *professor, Asian Languages and Literature, 1973 (1985)*

Cochran, Edwin M., D.D.S. Iowa 1973; *adjunct instructor, Family Dentistry, 1974*

Cochran, Lida, B.A. Washburn 1934, B.A. Central Washington State 1960, M.A. 1960; *associate professor emeritus, Psychological and Quantitative Foundations, 1961 (1981)*

Coffey, Mark A., B.A. Seattle Pacific 1975, M.A. 1981; *assistant professor, Military Science, 1989*

Coffman, Don D., B.M.E. Kansas 1978, M.M.E. Wichita State 1984, Ph.D. Kansas 1987; *assistant professor, Curriculum and Instruction, 1988*

Coffman, Robert E., B.S. Illinois 1953, M.S. California (Berkeley) 1955, Ph.D. Minnesota 1964; *professor, Chemistry, 1967 (1979)*

Coffman, William E., B.S. Wittenberg 1934, M.A. West Virginia 1938, Ed.D. Columbia 1949; *E.F. Lindquist professor emeritus, Psychological and Quantitative Foundations, 1969 (1981)*

Coil, James A., Jr., A.B. Colorado College 1958, M.D. Case Western Reserve 1963; *clinical associate professor, Surgery, 1989*

Colangelo, M. Kay, B.A. North Carolina 1969, Ph.D. Wisconsin 1976; *adjunct assistant professor, Counselor Education, 1979*

Colangelo, Nicholas, B.A. State University of New York (Cortland) 1970, M.Ed. Vermont 1973, Ph.D. Wisconsin 1977; *Myron and Jacqueline Blank professor, Counselor Education, 1977 (1986)*

Cole, Catherine A., B.A. Beloit 1971, M.B.A. Wisconsin 1976, Ph.D. 1983; *assistant professor, Marketing, 1984*

Cole, Kelly J., B.S. Wisconsin (Madison) 1977, M.S. 1981, Ph.D. 1984; *assistant professor, Exercise Science, 1987*

Collins, Daniel W., B.B.A. Iowa 1968, Ph.D. 1973; *Henry B. Tippie professor, Accounting, 1977 (1981)*

Collins, Gayle, B.S. Iowa 1972, M.A. 1975; *adjunct assistant professor, Dental Hygiene, 1975 (1987)*

Collins, Paul J., D.D.S. Iowa 1966, M.S. 1973; *associate professor, Periodontics, 1969 (1982)*

Collins, Steve M., B.S. Illinois (Chicago Circle) 1971, M.S. 1974, Ph.D. 1977; *professor, Electrical and Computer Engineering/Biomedical Engineering, 1976 (1987)*

Conaway, Mark R., B.A. Grinnell 1980, Ph.D. Minnesota 1985; *assistant professor, Statistics and Actuarial Science, 1985*

Cone, James D., B.S. Iowa 1979, M.S.W. 1986; *adjunct assistant professor, School of Social Work, 1989*

Conklin, Jeffrey L., B.S. Iowa 1973, M.D. 1978; *assistant professor, Internal Medicine, 1985*

Conley, Pat, B.A. St. Paul 1961, M.S.W. Nebraska 1968; *adjunct instructor, School of Social Work, 1981*

Conlon, Donald J., D.D.S. Iowa 1957, M.S. 1957; *adjunct associate professor, Pediatric Dentistry, 1977 (1986)*

Conlon, Edward J., B.S. Pennsylvania State 1972, M.S. Carnegie-Mellon 1975, Ph.D. 1978; *professor, Management and Organizations, 1982 (1989)*

Conn, P. Michael, B.S. Michigan 1971, M.S. North Carolina State 1973, Ph.D. Baylor 1976; *professor, Pharmacology, 1984*

Connelly, Deidre, B.S. Bridgeport 1974, M.Ed. Virginia 1984, Ph.D. 1986; *assistant professor, Physical Education and Sports Studies, 1987 (1988)*

Conner, John W., B.S. Creighton 1950, M.A. Iowa 1962, Ph.D. 1966; *associate professor, Curriculum and Instruction, 1967 (1970)*

Conroy, Frank, B.A. Haverford, 1958; *professor, English, 1987*

Cons, Naham C., B.S. Brooklyn 1935, D.D.S. New York 1940, M.P.H. Columbia 1958; *professor emeritus, Preventive and Community Dentistry, 1979 (1984)*

Contant, Cheryl K., B.S. Utah 1977, M.S. Stanford 1979, Ph.D. 1984; *assistant professor, Urban and Regional Planning/Civil and Environmental Engineering, 1985*

Contrada, Deborah, A.B. Mount Holyoke 1972, A.M. Middlebury 1973, Ph.D. Harvard 1985; *assistant professor, French and Italian, 1986*

Conway, Thomas W., B.S. St. Thomas 1953, M.A. Texas 1955, Ph.D. 1962; *professor, Biochemistry, 1964 (1973)*

Conybeare, John A. C., B.A. Australian National 1971, A.M. Harvard 1974, Ph.D. 1976; *professor, Political Science, 1987 (1988)*

Cook, Brian L., B.A. Grinnell 1976, D.O. College of Osteopathic Medicine and Surgery 1979, M.S. Iowa 1984; *assistant professor, Psychiatry, 1986*

Cook, Robert T., A.B. Kansas 1958, M.D. 1962, Ph.D. 1967; *associate professor, Pathology, 1977*

Cook, Thomas M., B.A. Thomas More (Kentucky) 1968, M.S. Duke 1973, M.S. Drexel 1980, Ph.D. Iowa 1987; *assistant professor, Physical Therapy, 1987*

Coolidge, Archibald C., B.A. Harvard 1951, M.A. Brown 1954, Ph.D. 1956; *professor, English, 1956 (1974)*

Cooper, Joyce M. Richmond, B.A. Clark 1977, Ph.D. Pennsylvania 1985; *assistant professor, Economics/Geography, 1985*

Cooper, Reginald R., B.A. West Virginia 1952, B.S. 1953, M.D. Medical College of Virginia 1955, M.S. Iowa 1960; *Carroll B. Larson professor, Orthopaedic Surgery, 1962 (1971)*

Cooper, Russell W., B.A. Clark 1977, M.A. Pennsylvania 1979, Ph.D. 1982; *professor, Economics, 1985 (1989)*

Cooper, Steven H., D.D.S. Iowa 1966, M.S. 1970; *adjunct assistant professor, Periodontics, 1988*

Corbae, P. Dean, B.A. Colgate 1982, M.A. Yale 1984, M.Phil 1987; *instructor, Economics, 1989*

Corbett, James J., B.A. Brown 1962, M.D. Chicago 1966; *professor, Neurology/ Ophthalmology, 1977 (1985)*

Cordier, Hubert V., B.A. Manchester 1939, M.A. Michigan State 1942, Ph.D. Illinois 1954; *professor emeritus, Communication Studies, 1968 (1982)*

Cornelius, Albert S., B.S. Michigan State 1978, M.D. Wayne State 1982; *assistant professor, Pediatrics, 1989*

Cornell, Steven H., B.S. Michigan 1950, M.D. 1953; *professor, Radiology, 1963 (1971)*

Correy, Maurice A., D.D.S. Iowa 1960; *adjunct instructor, Preventive and Community Dentistry, 1976*

Corry, Linda S., B.S.Ed. Fitchburg State 1963, M.A. Iowa 1985; *adjunct instructor, Nursing, 1987*

Corry, Robert J., A.B. Yale 1957, M.D. Johns Hopkins 1961; *professor, Surgery, 1973 (1976)*

Corson, John D., M.B.Ch.B. Edinburgh 1968; *professor, Surgery, 1986 (1989)*

Coryell, William H., B.S. Georgia 1970, M.D. Medical College of Georgia 1973; *professor, Psychiatry, 1977 (1986)*

Coss, Elizabeth A., B.S.N. St. Mary's (Kansas) 1959, M.B.A. Xavier 1964; *adjunct assistant professor, Nursing, 1985*

Cossman, George W., A.B. Shimer 1952, B.S. Illinois 1954, M.Ed. 1955, Ph.D. Iowa 1967; *associate professor, Curriculum and Instruction, 1966 (1970)*

Costantino, Anthony, A.B. Cornell 1931, LL.B. 1936, Ph.D. California (Berkeley) 1956; *professor emeritus, Economics, 1956 (1978)*

Couch, Carl J., B.A. Iowa 1951, M.A. 1954, Ph.D. 1955; *professor, Sociology, 1965 (1988)*

Coulter, Joe Dan, B.A. Oklahoma 1966, Ph.D 1971; *professor, Anatomy, 1985*

Covington, Cary R., B.A. Whittier 1973, M.A. Illinois (Urbana) 1975, Ph.D. 1981; *associate professor, Political Science, 1982 (1988)*

Cowart, Susan D., B.A. Georgia 1967, M.A. 1968, Ph.D. Iowa 1983; *adjunct assistant professor, Geography, 1985*

Cowdery, John S., Jr., B.A. Duke 1971, M.S. Emory 1974, M.D. 1978; *associate professor, Internal Medicine, 1983 (1988)*

Cowen, Howard J., B.A. Colorado 1972, D.D.S. Iowa 1976; *clinical instructor, Preventive and Community Dentistry, 1982*

Cox, Charles D., B.S. William and Mary 1967, Ph.D. Georgia 1971; *professor, Microbiology, 1974 (1988)*

Cox, Jeffrey L., B.A. Rice 1970, A.M. Harvard 1971, Ph.D. 1978; *professor, History, 1977 (1988)*

Cox, Sister Ruth A., B.S.N. Loyola (Chicago) 1968, M.S.N. 1970, M.A. 1974, Ph.D. Iowa 1984; *adjunct assistant professor, Nursing, 1985*

Crabb, Larry J., D.D.S. Baylor 1958; *associate professor, Family Dentistry, 1977 (1979)*

Craft, John Leonard, B.S. Iowa 1968, M.A. 1970, Ph.D. 1971; *associate professor, School of Social Work, 1977 (1980)*

Craft, Martha J., B.S.N. Iowa 1970, M.A. 1978, Ph.D. 1985; *associate professor, Nursing, 1980 (1986)*

Cragg, Andrew H., B.A. St. Johns 1978, M.D. Minnesota 1981; *assistant professor, Radiology, 1987*

Craig, Steven R., B.S. Iowa 1975, M.D. 1979; *clinical assistant professor, Internal Medicine, 1988 (1989)*

Cram, Albert E., B.S. Nebraska 1965, M.D. 1969; *associate professor, Surgery/Orthopaedic Surgery/ Otolaryngology-Head and Neck Surgery, 1975 (1980)*

Cranberg, Gilbert, B.A. Syracuse 1949, M.A. Drake 1956; *George Gallup professor, School of Journalism and Mass Communication, 1982*

Crane, Frederick, B.A. Carleton 1949, M.A. Iowa 1956, Ph.D. 1960; *professor, School of Music, 1968 (1980)*

Craven, John D., B.A. Iowa 1963, M.S. 1964, Ph.D. 1969; *adjunct professor, Physics and Astronomy, 1989*

Cremers, Bernard J., B.S.Ph. Iowa 1964; *clinical instructor, Pharmacy, 1976*

Crist, Janet K., B.S.N. Iowa 1961, M.A. 1977; *adjunct instructor, Nursing, 1972 (1979)*

Cross, Lowell M., B.A. Texas Tech 1961, B.A. Texas Tech 1963, M.A. Toronto (Canada) 1968; *professor, School of Music, 1972 (1981)*

Cross, Norma, B.M. Iowa 1941, M.F.A. 1942; *associate professor emeritus, School of Music, 1944 (1987)*

Crossley, John D., B.S.N. Michigan 1975, M.S.N. North Carolina 1982, M.B.A. Pennsylvania 1985; *adjunct instructor, Nursing, 1987*

Crowe, Raymond R., B.A. Vanderbilt 1963, M.D. 1966; *professor, Psychiatry, 1972 (1981)*

Crowell, Carolyn M., B.S.N. Iowa 1966, M.N. Washington 1968; *assistant professor, Nursing, 1968 (1969)*

Cruden, Robert W., A.B. Hiram 1958, M.S. Ohio State 1960, Ph.D. California (Berkeley) 1967; *professor, Botany, 1967 (1978)*

Cryer, Jonathan D., B.A. DePauw 1961, Ph.D. North Carolina 1966; *associate professor, Statistics and Actuarial Science, 1966 (1970)*

Culp, David A., B.S. Bucknell 1941, M.D. Jefferson Medical College of Philadelphia 1944; *professor emeritus, Urology, 1951 (1984)*

Cummins, Phillip D., B.A. Iowa 1957, M.A. 1959, Ph.D. 1961; *professor, Philosophy, 1963 (1974)*

Cunnick, Paul C., B.S. St. Ambrose 1943, M.D. Iowa 1947; *clinical assistant professor, Surgery, 1988*

Cunningham, Marsha A., B.S. Old Dominion 1976, M.S. 1979; *associate professor, Preventive and Community Dentistry, 1979 (1985)*

Currie, Jay D., B.S.Ph. Iowa 1980, Pharm.D. 1984; *clinical assistant professor, Pharmacy, 1984*

Currier, Russell W., B.S. Minnesota 1967, D.V.M. 1967, M.P.H. 1969; *adjunct assistant professor, Preventive Medicine and Environmental Health, 1979*

Curry, David J., B.S. Colorado 1967, M.B.A. 1968, Ph.D. California (Berkeley) 1973; *professor, Marketing, 1972 (1983)*

Curtis, James F., B.A. Iowa State Teachers 1935, M.A. Iowa 1940, Ph.D. 1942; *professor emeritus, Speech Pathology and Audiology, 1946 (1979)*

Curto, Raul E., B.S. San Luis (Argentina) 1975, M.A. S.U.N.Y. (Stony Brook) 1978, Ph.D. 1978; *professor, Mathematics, 1981 (1987)*

Cutrona, Carolyn E., B.A. Stanford 1973, M.A. New Mexico 1974, Ph.D. U.C.L.A. 1981; *associate professor, Psychology, 1980 (1986)*

Cuttler, Charles D., B.F.A. Ohio State 1935, M.A. 1937, Ph.D. New York 1952; *professor emeritus, School of Art and Art History, 1957 (1983)*

Cuykendall, Robert R., B.Sc. Massachusetts Institute of Technology 1968, M.S. California (Los Angeles) 1974, Ph.D. 1984; *associate professor, Electrical and Computer Engineering, 1985*

Dahl, Eva C., B.A. Iowa 1972, D.D.S. 1976, M.A. 1979, M.S. 1982; *adjunct associate professor, Oral Pathology and Diagnosis, 1980 (1986)*

Dahlberg, Philip J., B.S. Wisconsin State (Whitewater) 1968, M.D. Iowa 1972; *clinical instructor, Internal Medicine, 1988*

Dailey, Morris O., B.S. California (Davis) 1971, Ph.D. Chicago 1976, M.D. 1977; *associate professor, Pathology, 1984 (1989)*

Dallam, Jerald W., B.S. Northwest Missouri State 1959, M.S. Oklahoma State 1964, Ph.D. Kansas State 1977; *adjunct assistant professor, Planning, Policy and Leadership Studies, 1983*

Daly, George, B.A. Miami (Ohio) 1962, M.A. Northwestern 1965, Ph.D. 1967; *professor, Economics, 1983*

Damasio, Antonio J., M.D. Lisbon (Portugal) 1968, Ph.D. 1974; *University of Iowa Foundation/Maurice Van Allen professor, Neurology, 1975 (1980)*

Damasio, Hanna M., M.D. Lisbon (Portugal) 1968; *professor, Neurology, 1975 (1985)*

D'Angelo, Nicola, Dr. Rome (Italy) 1953; *professor, Physics and Astronomy, 1976*

Daniels, Julie S., B.A. Augustana (Illinois) 1983, D.D.S. Iowa 1987; *adjunct instructor, Preventive and Community Dentistry, 1988 (1989)*

Daniels, Lacy, B.A. Texas 1972, Ph.D. Wisconsin 1978; *associate professor, Microbiology, 1981 (1987)*

Daniels, Robert S., B.A. Augustana 1983, D.D.S. Iowa 1987; *adjunct instructor, Preventive and Community Dentistry, 1989*

Danielson, Deborah J., B.S.N. Northeast Missouri State 1974, M.A. Iowa 1976, Ed.D. Drake 1985; *adjunct assistant professor, Nursing, 1986*

Danielson, Stanton L., B.S. Iowa State 1971, M.D. Iowa 1976; *clinical assistant professor, Family Practice, 1982 (1984)*

Darling, Warren G., B.Sc. Waterloo (Ontario) 1979, M.Sc. 1981, Ph.D. Western Ontario 1986; *assistant professor, Exercise Science, 1987*

Dasgupta, Soura, B.E. Queensland (Australia) 1980, Ph.D. Australian National 1985; *associate professor, Electrical and Computer Engineering, 1989 (1990)*

Datta, Ravindra, B. Tech. Indian Institute of Technology (Kharagpur) India 1972, Ph.D. California (Santa Barbara) 1981; *associate professor, Chemical and Biochemical Engineering, 1981 (1986)*

Daughety, Andrew F., A.M. Southern California 1975, M.S. Case Western Reserve 1971, Ph.D. 1972; *professor, Economics/Management Sciences, 1981 (1986)*

Dave, Bhasker J., M.D. Bombay (India) 1967; *clinical instructor, Psychiatry, 1975*

Davidson, Charles W., B.S.B.A. Ohio State 1947, J.D. 1949, LL.M. Michigan 1950; *professor emeritus, Law, 1950 (1988)*

Davies, William, M.A. California (San Diego) 1979, C.Phil. 1980, Ph.D. 1981; *associate professor, Linguistics, 1986 (1989)*

Davis, Carl S., B.A. Cornell 1961, M.Ed. St. Lawrence 1966, Ph.D. Syracuse 1973; *associate professor, Psychological and Quantitative Foundations, 1973 (1977)*

Davis, Charles S., B.A. Houghton 1974, M.S. McMaster 1977, Ph.D. Michigan (Ann Arbor) 1987; *assistant professor, Preventive Medicine and Environmental Health, 1987*

Davis, Lane, B.A. Kansas 1941, M.A. Cornell 1948, Ph.D. 1950; *professor emeritus, Political Science, 1949 (1988)*

Davis, Leodis, B.S. Missouri 1956, M.S. Iowa State 1958, Ph.D. 1960; *professor, Chemistry, 1968 (1976)*

Davis, Patricia J., M.S.W. Iowa 1983; *adjunct instructor, School of Social Work, 1983*

Davis, Thomas L., B.M.Ed. Northwestern 1957, M.M. 1958; *professor, School of Music, 1958 (1974)*

Davison, Alice L., A.B. Bryn Mawr 1962, M.A. Chicago 1969, Ph.D. 1973; *associate professor, Linguistics, 1988*

Daws, William R., B.A. Northern Iowa 1972, M.D. Iowa 1976; *clinical assistant professor, Pediatrics, 1981*

Day, David W., *adjunct professor, Management and Organizations, 1986*

De, Suranjan, B.Sc. Indian Institute of Technology 1974, M.Sc. 1976, M.S. Ohio State 1980, Ph.D. Purdue 1984; *assistant professor, Management Sciences, 1985*

De Alarcon, Pedro A., B.A. Harvard 1968, M.D. George Washington 1972; *associate professor, Pediatrics, 1983 (1988)*

Deegan, James Wayne, B.A.M.E. Iowa 1934, M.S.I.E. 1935; *professor emeritus, Industrial and Management Engineering, 1949 (1979)*

DeGowin, Richard L., M.D. Chicago 1959; *professor, Internal Medicine/Radiology, 1968 (1973)*

deGravelles, William, B.S. Southwestern Louisiana Institute 1949, M.D. Tulane 1952; *clinical assistant professor, Orthopaedic Surgery, 1964*

DeJong, Deborah, B.A. William Penn 1977, B.S.N. Coe 1979, M.S. Minnesota 1985; *adjunct instructor, Nursing, 1986*

DeJong, Douglas V., B.B.A. Iowa 1970, M.B.A. 1971, Ph.D. Michigan 1980; *associate professor, Accounting, 1980 (1986)*

DeKock, William H., B.A. Iowa 1960, D.D.S. 1963, M.S. 1967; *adjunct professor, Orthodontics, 1967 (1982)*

Delaney, Connie, B.S.N. Viterbo 1975, M.A. Iowa 1978, Ph.D. 1986; *assistant professor, Nursing, 1986 (1987)*

Delaney, John T., B.S. LeMoyne 1977, M.A. Illinois 1980, Ph.D. 1983; *associate professor, Management and Organizations, 1989*

Delaty, Simone, Licence-és-Lettres Grenoble (France) 1962, Ph.D. Bordeaux (France) 1970; *professor, French and Italian, 1968 (1986)*

Deligiorgis, Stavros, B.A. Athens (Greece) 1960, M.A. Yale 1958, Ph.D. California (Berkeley) 1966; *professor, English/Comparative Literature, 1965 (1973)*

Dellsperger, Kevin C., B.S. Tulane 1978, Ph.D. Louisiana State (Shreveport) 1983, M.D. 1983; *assistant professor, Internal Medicine, 1989*

Delworth, Ursula M., B.A. California State (Long Beach) 1956, M.A. California State (Los Angeles) 1962, Ph.D. Oregon 1969; *professor, Psychological and Quantitative Foundations, 1976*

De Mello, George, B.A. Massachusetts 1954, M.A. Colorado 1959, Ph.D. 1968; *associate professor, Spanish and Portuguese, 1967 (1970)*

Denburg, Jeffrey L., B.A. Amherst 1965, Ph.D. Johns Hopkins 1970; *professor, Biology, 1977 (1990)*

Denehy, Gerald, D.D.S. Loma Linda 1968, M.S. Iowa 1970; *professor, Operative Dentistry, 1968 (1977)*

Denehy, Janice A., B.S. Loma Linda 1966, M.A. Iowa 1971, Ph.D. 1978; *assistant professor, Nursing, 1968 (1979)*

Dennis-Smithart, Ronda K., B.S. Iowa 1978, M.D. 1982; *clinical assistant professor, Pediatrics, 1988*

Densen, Peter, B.A. Colby 1966, M.D. Johns Hopkins 1970; *associate professor, Internal Medicine, 1983 (1985)*

Deopere, David, B.S. Western Illinois 1970, M.A. Maryland 1976, Ph.D. Iowa 1987; *adjunct instructor, School of Social Work, 1988*

DeProsse, Charles A., A.B. Cornell 1946, M.D. 1950, M.P.H. California (Berkeley) 1972; *associate professor, Obstetrics and Gynecology, 1972 (1978)*

DePuma, Richard D., B.A. Swarthmore 1964, M.A. Bryn Mawr 1967, Ph.D. 1969; *professor, School of Art and Art History, 1968 (1986)*

Deranleau, Nancy J., R.D.H. Marquette 1969, B.S.D.H. 1976, M.Ed. 1980; *adjunct assistant professor, Preventive and Community Dentistry, 1989*

de Saint Victor, Carol, B.A. Indiana 1956, Ph.D. 1966; *professor, English, 1966 (1984)*

Deschenes, Robert, B.A. St. Michaels 1977, M.S. Tufts 1980, Ph.D. Purdue 1984; *assistant professor, Biochemistry, 1988*

Dettl, Mark J., B.S. Michigan Technological 1979, M.B.A. Western New England 1983; *assistant professor, Aerospace Military Studies, 1989*

Dettmer, Helena R., B.A. Indiana 1972, Ph.D. Michigan 1976; *associate professor, Classics, 1976 (1982)*

Deutelbaum, Wendy, B.A. Northwestern 1969, M.S.W. Iowa 1985, Ph.D. New York 1978; *adjunct assistant professor, School of Social Work, 1975 (1988)*

Díaz-Duque, Oswald F., B.A. Queens 1973, M.A. Iowa 1975; *adjunct assistant professor, Spanish and Portuguese, 1980 (1982)*

Díaz-Arnold, Ana M., B.S. Indiana 1979, D.D.S. 1983, M.S. Iowa 1987; *assistant professor, Family Dentistry, 1987*

DiBona, Gerald F., A.B. Harvard 1960, M.D. Tufts 1964; *professor, Internal Medicine, 1969 (1975)*

Dick, Fred R., B.A. Iowa 1963, M.D. 1967; *professor, Pathology, 1974 (1983)*

Dick, Robert W., B.S. Drake 1965, M.S. Iowa 1972; *adjunct associate professor, Pharmacy, 1987*

Diehl, David L., D.D.S. Iowa 1964, M.S. 1977; *adjunct associate professor, Orthodontics, 1968 (1988)*

Diehl, Huston, B.A. Colorado College 1970, M.A. Duke 1971, Ph.D. 1975; *associate professor, English, 1985*

Diehl, Paul B., B.A. Texas 1966, M.A. 1970, Ph.D. 1976; *associate professor, English, 1975 (1981)*

Dietz, Frederick R., A.B. Harvard 1973, M.D. Columbia 1977; *associate professor, Orthopaedic Surgery, 1984 (1989)*

Diffley, Kathleen E., B.A. Bard 1972, M.Ed. Harvard 1974, M.A. Columbia 1977, M.Phil. 1980, Ph.D. 1983; *assistant professor, English, 1983*

Dilg, John, B.F.A. Rhode Island School of Design 1969; *professor, School of Art and Art History, 1975 (1987)*

Dillman, Judith B., B.A. Utah 1971, M.A. 1972, M.D. Maryland (Baltimore) 1979; *clinical assistant professor, Anesthesia, 1982 (1990)*

Disselhorst, Delbert, B.Mus. Illinois 1962, M.Mus. 1965, D.M.A. Michigan 1970; *professor, School of Music, 1970 (1980)*

Dittmer, Mark A., D.D.S. Iowa 1986; *clinical instructor, Oral and Maxillofacial Surgery, 1989*

Dixon, Donna L., B.S. Clemson 1980, D.M.D. South Carolina 1984; *assistant professor, Prosthodontics, 1988*

Dixon, James A., B.A. Iowa 1952, M.A. 1956; *Carver/Philip Greeley Clapp professor, School of Music, 1962 (1968)*

Dobrian, Walter, B.A. Wisconsin 1952, Ph.D. 1960; *associate professor, Spanish and Portuguese, 1962 (1965)*

Dodd, Theora E., B.S. Loyola (Chicago) 1976, M.S.W. 1978, M.P.H. Illinois (Chicago) 1987; *clinical assistant professor, School of Social Work, 1988*

Doering, John V., B.A. Regis 1966, D.D.S. Iowa 1970, M.A. 1976; *professor, Family Dentistry, 1974 (1989)*

Dolan, Kenneth D., B.A. Iowa 1952, M.D. 1956; *professor, Radiology, 1966 (1974)*

Donahue, M. Patricia, B.S.N. Ohio State 1962, M.S.N. 1971, Ph.D. Iowa 1981; *associate professor, Nursing, 1976 (1980)*

Donelson, John E., B.S. Iowa State 1965, Ph.D. Cornell 1971; *University of Iowa Foundation professor, Biochemistry, 1974 (1981)*

Donham, Kelley J., B.S. Iowa 1966, M.S. 1970, D.V.M. Iowa State 1971; *professor, Preventive Medicine and Environmental Health, 1973 (1985)*

Donovan, James F., Jr., B.A. Colorado 1974, M.D. Northwestern 1978; *assistant professor, Urology, 1986*

Donovan, Maureen D., B.S.Ph. Minnesota 1983, Ph.D. Michigan 1989; *assistant professor, Pharmacy, 1989*

Doornbos, John F., B.S.Ed. Kansas 1950, M.D. 1957; *assistant professor, Radiology, 1989*

Dordick, Jonathan S., B.S. Brandeis 1980, M.S. Massachusetts Institute of Technology 1982, Ph.D. 1986; *assistant professor, Chemical and Biochemical Engineering, 1987*

Dorfman, Donald, B.A. Pennsylvania 1954, M.A. Michigan 1957, Ph.D. 1961; *professor, Psychology, 1968 (1974)*

Dorfman, Lorraine T., B.S. Temple 1957, M.A. Michigan 1959, Ph.D. Iowa 1978; *professor, Home Economics, 1969 (1988)*

Dorman, Jane F., B.S.N. Mount Mercy 1948, M.S.N. Wayne State 1968; *adjunct instructor, Nursing, 1971 (1982)*

Dornberg, Diane, B.A. Gustavus Adolphus 1973, J.D. Michigan 1976; *adjunct assistant professor, School of Social Work, 1982 (1984)*

Dorner, Douglas B., B.A. Amherst College 1963, M.D. Harvard 1967; *clinical assistant professor, Surgery, 1973 (1981)*

Doro, Joseph M., B.S. Columbia 1972, D.O. College of Osteopathic Medicine and Surgery 1975; *clinical assistant professor, Neurology, 1984*

Dostal, William F., B.A. Iowa 1964, M.A. 1966, Ph.D. 1979; *adjunct assistant professor, Physical Therapy, 1976 (1983)*

Doster, Philip M., D.D.S. Iowa 1957; *adjunct associate professor, Orthodontics, 1981 (1988)*

Douglass, R. Thomas, B.A. George Washington 1954, Ph.D. Pennsylvania 1964; *associate professor, Spanish and Portuguese, 1970*

Dove, Edwin L., B.S. Virginia Polytechnic Institute 1973, M.S. 1974, Ph.D. Case Western Reserve 1984; *assistant professor, Biomedical Engineering, 1985*

Downing, Donald T., B.S.C. Western Australia 1951, Ph.D. 1955; *professor, Dermatology, 1978*

Doyle, John R., B.S. Massachusetts Institute of Technology 1949, M.S. 1952, Ph.D. Tulane 1955; *professor, Chemistry, 1955 (1965)*

Doyle, Keri Ann C., B.S. Iowa 1982, D.D.S. 1986, M.S. 1989; *adjunct assistant professor, Pediatric Dentistry, 1989*

Dragstedt, Lester R., B.S. Northwestern 1950, M.S. 1950, M.D. 1953; *clinical professor, Surgery, 1968 (1980)*

Drake, David R., B.S. Purdue 1977, M.S. 1980, Ph.D. Tennessee 1985; *assistant professor, Oral Pathology and Diagnosis, 1988*

Drake, Lon D., B.A. Buffalo 1961, M.A. California (Los Angeles) 1965, Ph.D. Ohio State 1968; *professor, Geology, 1968 (1979)*

Drexler, Frederick R., B.A. Earlham 1972, D.D.S. Iowa 1975; *adjunct instructor, Prosthodontics, 1980 (1982)*

Driscoll, Charles E., B.S. Iowa 1967, M.D. 1971, M.S. Ball State 1974; *professor, Family Practice, 1976 (1987)*

Drummond, David W., B.S. California Institute of Technology 1962, M.S. Minnesota 1968, Ph.D. 1972; *adjunct assistant professor, Preventive Medicine and Environmental Health, 1980*

Druva-Roush, Cynthia A., B.S. Colorado State 1975, M.S. 1978, Ph.D. Minnesota 1984; *adjunct assistant professor, Psychological and Quantitative Foundations, 1984*

D'Souza, Joseph E., *adjunct assistant professor, Endodontics, 1983 (1987)*

Duarte, María A., B.A. Vanderbilt 1971, M.A. Texas 1974, Ph.D. Minnesota 1980; *associate professor, Spanish and Portuguese, 1982 (1989)*

Duck, Steven W., B.A. Oxford (England) 1968, M.A. 1972, Ph.D. Sheffield (England) 1971; *Daniel and Amy Starch professor, Communication Studies, 1986*

Dudziak, Mary L., B.A. California (Berkeley) 1978, J.D. Yale 1984; *professor, Law, 1986 (1990)*

Duerlinger, James P., B.A. Wisconsin 1961, M.A. Washington 1963, Ph.D. Wisconsin 1966; *professor, Philosophy, 1971 (1989)*

Duffel, Michael W., B.S. Texas (Austin) 1975, Ph.D. 1979; *associate professor, Pharmacy, 1981 (1986)*

Duffy, William E., B.S. Wayne State 1957, M.Ed. 1960, Ph.D. Northwestern 1967; *associate professor, Planning, Policy and Leadership Studies, 1965 (1970)*

Dull, David L., B.A. DePauw 1980, M.D. Wayne State 1984; *assistant professor, Anesthesia, 1989*

Dunbar, Stephen B., B.A. Wisconsin 1975, M.A. Illinois 1978, Ph.D. 1982; *associate professor, Psychological and Quantitative Foundations, 1982 (1987)*

Duncan, Sandra E., B.G.S. Iowa 1977, M.S.W. 1979; *adjunct instructor, School of Social Work, 1988*

Dungy, Claibourne I., B.S. Eastern Illinois 1962, M.D. Illinois 1967, M.P.H. Johns Hopkins 1971; *associate professor, Pediatrics, 1988*

Dunlap, David O., B.A. Colorado College 1962, B.F.A. Yale 1963, M.F.A. 1967; *assistant professor, School of Art and Art History, 1986*

Dunlap, Leslie W., B.A. Oregon 1933, M.A. Columbia 1938, B.S.L.S. 1939, Ph.D. 1944; *professor emeritus, School of Library and Information Science, 1958 (1981)*

Dunlap, Lurlene D., B.S.N. Alfred (New York) 1982, M.S.N. Rochester (New York) 1985; *adjunct instructor, Nursing, 1988*

Dunlap, Rhodes, B.A. Rice Institute 1931, M.A. 1932, B.Litt. Oxford (England) 1938, D.P. 1939; *professor emeritus, English, 1938 (1981)*

Dunlevy, James H., B.A. Iowa 1947, M.D. Washington (St. Louis) 1951; *clinical assistant professor, Family Practice, 1979 (1984)*

Dunner, Frederick J., B.S. George Washington 1967, M.D. 1973; *clinical assistant professor, Psychiatry, 1977 (1981)*

Dunnigan, Ann, B.A. Mt. Mercy, M.S.W. Loyola 1970; *adjunct instructor, School of Social Work, 1980*

Durán-Cerda, Julio, B.A. Liceo de Temucho (Chile) 1933, Ph.D. Chile 1944; *professor emeritus, Spanish and Portuguese, 1966 (1985)*

Durovicova, Natasa, B.A. Lund (Sweden) 1976, M.A. California (Santa Barbara) 1982; *instructor, Communication Studies, 1989*

Durrenberger, E. Paul, B.A. Texas 1964, M.A. Washington State 1966, Ph.D. Illinois 1971; *professor, Anthropology, 1972 (1982)*

Durumeric, Oguz C., B.S. Middle East Technical (Turkey) 1976, M.A. State University of New York (Stony Brook) 1980, Ph.D. 1982; *associate professor, Mathematics, 1987 (1989)*

Dusdieker, Lois B., B.A. Iowa 1970, M.D. 1974, M.S. 1979; *associate professor, Pediatrics, 1977 (1985)*

Dustin, E. Richard, B.A. Grinnell 1958, M.A. Iowa 1962, Ph.D. Minnesota 1968; *professor, Counselor Education, 1972 (1976)*

Dutta, Amitava, B.Tech. Indian Institute of Technology (Kharagpur) 1976, M.S. California (Santa Barbara) 1978, Ph.D. Purdue 1981; *associate professor, Management Sciences, 1986*

Dutton, Gary R., B.S. Washington 1961, M.S. Indiana 1965, Ph.D. 1967; *professor, Pharmacology, 1980 (1984)*

Dvoretzky, Edward, B.A. Rice Institute 1953, A.M. Harvard 1954, Ph.D. 1959; *professor, German, 1967*

Dyer, Carolyn S., B.A. Beloit 1965, M.A. Wisconsin 1973, Ph.D. 1978; *associate professor, School of Journalism and Mass Communication, 1978 (1984)*

Dykstra, Richard L., B.A. Central 1965, Ph.D. Iowa 1968; *professor, Statistics and Actuarial Science, 1982*

Eckert, Michael S., B.A. Antioch 1972, M.A. Chicago 1975, Ph.D. 1977; *associate professor, School of Music, 1985 (1988)*

Eckert, Robert W., B.A. Midland 1948, M.A. Wisconsin 1949, M.F.A. Iowa 1951; *professor, School of Music, 1964 (1978)*

Eckhardt, Richard D., A.B. Illinois 1940, M.D. Harvard 1943; *professor emeritus, Internal Medicine, 1949 (1980)*

Eckstein, John W., B.S. Loras 1946, M.D. Iowa 1950; *professor, Internal Medicine, 1954 (1965)*

Eddy, Martha E., B.S. Duquesne 1971, M.A. Iowa 1975; *adjunct instructor, Nursing, 1988*

Eden, Benjamin, B.A. Hebrew University 1971, Ph.D. Chicago 1975; *professor, Economics, 1981 (1983)*

Edgerton, W. Dow, M.D. Washington (Missouri) 1947; *clinical professor, Obstetrics and Gynecology, 1971 (1982)*

Edwards, Dorothea B., B.S. Minnesota, M.S. Wisconsin 1967, Ph.D. 1976; *adjunct assistant professor, Speech Pathology and Audiology, 1985*

Edwards, Warren P., Ph.D. Ohio 1968; *adjunct assistant professor, Psychiatry, 1977*

Eganhouse, Deborah J., B.S.N. Mt.Mercy 1979, M.A. Iowa 1988; *adjunct instructor, Nursing, 1989*

Ehly, Stewart W., B.A. Massachusetts 1971, Ph.D. Texas (Austin) 1975; *associate professor, Psychological and Quantitative Foundations, 1979 (1982)*

Ehmke, Dorothy A., B.S. Iowa State 1941, Ph.D. Iowa State 1946, M.D. Woman's Medical College of Pennsylvania 1955; *associate professor emeritus, Pediatrics, 1962 (1983)*

Ehrenhaft, Johann L., M.D. Iowa 1938; *professor emeritus, Surgery, 1947 (1986)*

Ehrenreich, Jeffrey, B.S. Bridgeport 1969, M.A. New School for Social Research 1972, Ph.D. 1985; *adjunct associate professor, Anthropology, 1990*

Ehrhardt, James C., B.A. Iowa 1964, M.A. California (Berkeley) 1968, Ph.D. 1970; *professor, Radiology, 1970 (1981)*

Eland, Joann M., B.S.N. Iowa 1970, M.A. Iowa 1974, Ph.D. 1980; *associate professor, Nursing, 1975 (1986)*

Elardo, Richard, B.A. Arizona State 1965, M.A. 1969, Ph.D. 1971; *associate professor, Curriculum and Instruction/Psychological and Quantitative Foundations, 1978*

Elbert, Dennis A., B.S. Iowa 1973; *clinical instructor, Pharmacy, 1976*

Elfenbein, Jill L., B.S. S.U.N.Y. (Albany) 1973, M.A. Iowa 1975, Ph.D. 1986; *assistant professor, Speech Pathology and Audiology, 1985 (1986)*

Eliason, Michele Jo, B.A. Iowa 1979, Ed.S. 1981, Ph.D. 1984; *assistant professor, Nursing, 1988*

Eliason, Scott R., B.A. Lock Haven 1983, M.A. Indiana University of Pennsylvania 1984, Ph.D. Pennsylvania State 1989; *assistant professor, Sociology, 1989*

El-Khoury, Georges Y., B.S. American (Lebanon) 1965, M.D. 1969; *professor, Radiology/ Orthopaedic Surgery, 1975 (1984)*

Elliott, Stephen C., A.B. Miami (Ohio) 1963, M.S. 1965, Ph.D. Arizona 1968, D.O. College of Osteopathic Medicine 1974; *clinical associate professor, Pediatrics, 1977*

Ellis, Mary, B.S. Iowa 1966, M.S. Iowa State 1982; *adjunct assistant professor, Nursing, 1984*

Else, John F., B.A. Nebraska 1961, M.Div. Yale 1964, M.A. Nebraska (Omaha) 1970, Ph.D. Brandeis 1977; *associate professor, School of Social Work, 1976 (1979)*

Embree, Robert W., B.A. Simpson 1954, M.S. Nebraska 1956, Ph.D. California (Berkeley) 1962; *associate professor, Botany, 1968*

Emery, Mary Lou, B.A. Oklahoma 1972, M.A. Stanford 1981, Ph.D. 1982; *associate professor, English, 1983 (1990)*

Emmons, Marcia A., B.S.N. Iowa, M.A. 1971; *adjunct instructor, Nursing, 1984*

Engel, Robert E., A.B. Cornell 1955, B.D. Drew 1958, Ph.D. Iowa 1969; *associate professor, Planning, Policy and Leadership Studies, 1968 (1978)*

Engen, Harold B., B.A. Buena Vista 1951, M.Ed. South Dakota 1957, Ed.D. 1964; *professor, Counselor Education, 1964 (1984)*

England, Nora C., B.A. Bryn Mawr 1967, M.A. Florida 1971, Ph.D. 1975; *professor, Anthropology, 1977 (1989)*

Engle, Hualing Nieh, B.A. National Central (China) 1948, M.F.A. Iowa 1966, L.H.D. Dubuque 1981, L.H.D. Colorado 1981, L.H.D. Coe 1982; *professor emeritus, English, 1965 (1988)*

Engle, Paul, B.A. Coe 1931, M.A. Iowa 1932, A.B. Oxford (England) 1936, M.A. 1939, D.Litt. Coe 1946, D.Litt. Iowa Wesleyan 1956, L.H.D. Dubuque *Clark F. Ansley professor emeritus, English, 1937 (1977)*

Ennis, Edith E., B.S.C. Iowa 1940, M.A. 1950; *assistant professor emeritus, Management and Organizations, 1954 (1987)*

Ephgrave, Kimberly S., B.A. California (Santa Cruz) 1977, M.D. Loyola-Stritch 1980; *assistant professor, Surgery, 1987*

Epley, Donald L., B.S. Illinois 1956, M.S. 1957, Ph.D. 1960; *professor, Computer Science, 1963 (1967)*

Erbe, Carl Frederic, B.A. Iowa State Teachers 1949, M.A. Iowa 1950, Ph.D. 1954, D.D.S. 1960; *assistant professor, Operative Dentistry, 1962 (1963)*

Erickson, Eva H., B.S. Columbia 1939, M.S. Northwestern 1947, Ed.D. Columbia (Teacher's College) 1972; *professor emeritus, Nursing, 1962 (1977)*

Erickson, John E., B.A. Barrington 1962, M.S. Illinois 1967, Ph.D. 1973; *associate professor, School of Journalism and Mass Communication, 1976*

Ertl, Wolfgang, B.A. Marburg (Germany) 1969, M.A. New Hampshire 1970, Ph.D. Pennsylvania 1975; *professor, German, 1977 (1988)*

Eskin, Gerald J., B.S. Maryland 1957, Ph.D. Minnesota 1971; *adjunct professor, Marketing, 1972 (1987)*

Ettema, Robert, B.E. Auckland (New Zealand) 1974, M.E. 1976, Ph.D. 1980; *associate professor, Civil and Environmental Engineering/ Mechanical Engineering 1980 (1986)*

Ettinger, Ronald, B.D.S. Sydney (Australia) 1966, M.D.S. 1970; *professor, Prosthodontics, 1973 (1980)*

Evans, David H., B.S. Lehigh 1948, Ph.D. Brown 1953; *adjunct professor, Industrial and Management Engineering, 1982*

Evans, Karen K., B.S.N. Iowa 1974, M.A. 1978; *adjunct instructor, Nursing, 1985*

Even, Harvey L., M.S. Minnesota 1976, D.D.S. 1986; *adjunct assistant professor, Preventive and Community Dentistry, 1986*

Eyanson, Steven, B.S. Iowa State 1970, M.D. Iowa 1974; *clinical assistant professor, Internal Medicine, 1986*

Eyman, Darrell P., B.S. Eureka 1959, Ph.D. Illinois 1964; *associate professor, Chemistry, 1964 (1969)*

Eyman, Earl D., B.S. Illinois 1949, M.S. 1950, Ph.D. Colorado 1966; *professor, Electrical and Computer Engineering, 1966 (1969)*

Faber, Luke C., B.S. Holy Cross 1951, M.D. Iowa 1955; *clinical associate professor, Surgery, 1984 (1988)*

Fahr, Samuel M., B.A. Harvard 1940, LL.B. 1947; *professor emeritus, Law, 1947 (1989)*

Fales, Evan, B.A. Haverford 1964, M.A. Temple 1971, Ph.D. 1974; *associate professor, Philosophy, 1974 (1979)*

Fallon, Bernard, B.Sc. University College Dublin (Ireland) 1968, M.B.B.Ch. 1970; *professor, Urology, 1975 (1990)*

Faraci, Frank M., B.S. Kansas 1978, M.A. 1980, Ph.D. Kansas State 1984; *adjunct assistant professor, Internal Medicine, 1989*

Farrell, Thomas A., A.B. Hamilton 1957, M.D. McGill (Canada) 1961; *assistant professor, Ophthalmology, 1987*

Fassler, Jan Stacy, B.S. Cornell (New York) 1976, Ph.D. Purdue 1983; *assistant professor, Biology, 1987*

Fearing, Margery O., B.S. Wyoming 1957, M.A. Iowa 1964; *adjunct instructor, Nursing, 1974 (1982)*

Feeley, James E., B.S. Illinois (Urbana) 1978, M.D. Illinois (Chicago) 1982; *clinical assistant professor, Internal Medicine, 1987*

Feiss, Michael G., B.S. Utah 1963, M.S. Illinois 1965, Ph.D. Washington 1969; *professor, Microbiology, 1972 (1982)*

Feld, Ronald D., B.S. Massachusetts 1968, Ph.D. Wisconsin 1974; *associate professor, Pathology, 1976 (1980)*

Felder, Robert B., A.B. North Carolina 1968, M.D. 1972; *associate professor, Internal Medicine, 1980 (1988)*

Feldick, Mark D., *clinical instructor, Pharmacy, 1980*

Feldstein, Peter, B.A. Iowa 1965, M.A. 1968, M.F.A. 1975; *professor, School of Art and Art History, 1973 (1989)*

Feldt, Leonard S., B.S.Ed. Rutgers 1950, M.Ed. 1951, Ph.D. Iowa 1954; *E. F. Lindquist professor, Psychological and Quantitative Foundations/Statistics and Actuarial Science, 1954 (1964)*

Felion, Paul L., M.D. Minnesota 1958; *clinical instructor, Obstetrics and Gynecology, 1982*

Felling, Charles R., B.A. Iowa 1959, M.A. 1960, Ph.D. 1975; *adjunct assistant professor, Speech Pathology and Audiology, (1981)*

Fellingham, John C., A.B. Stanford 1969, M.S. California (Los Angeles) 1971, Ph.D. 1975; *Ernst and Young professor, Accounting, 1987*

Fellows, Robert E., A.B. Hamilton 1955, M.D. McGill (Canada) 1959, Ph.D. Duke 1966; *professor, Physiology and Biophysics, 1976*

Felton, Geraldene, B.S.N. Wayne State 1960, M.S. 1962, Ed.D. New York 1969; *professor, Nursing, 1981*

Ferguson, David W., B.A. Drake 1973, M.D. Northwestern 1977; *associate professor, Internal Medicine, 1982 (1989)*

Ferguson, Kristi Jo, B.A. Concordia 1971, M.S.W. Michigan 1973, Ph.D. 1982; *adjunct assistant professor, Preventive Medicine and Environmental Health, 1984*

Ferguson, Richard L., B.S. Indiana University of Pennsylvania 1962, M.A. Western Michigan 1966, Ph.D. Pittsburgh 1969; *adjunct assistant professor, Psychological and Quantitative Foundations, 1975*

Fernández, Oscar, A.B. Washington (Missouri) 1937, M.A. 1940, Ph.D. Wisconsin 1953; *professor emeritus, Spanish and Portuguese, 1967 (1986)*

Fernández-Barros, Enrique, J.D. Havana (Cuba) 1954, Ph.D. 1955, Ph.D. Miami 1968; *associate professor, Spanish and Portuguese, 1967 (1970)*

Fethke, Carol C., A.B. Wellesley 1964, M.A. Iowa 1966, Ph.D. 1971; *professor, Home Economics, 1975 (1990)*

Fethke, Gary C., B.A. Iowa 1964, Ph.D. 1968; *professor, Management Sciences/Economics, 1974 (1985)*

Fick, Robert B., Jr., B.A. Wisconsin 1971, M.D. Northwestern 1975; *associate professor, Internal Medicine, 1982 (1987)*

Field, Elizabeth H., A.B. Millersville 1974, M.D. Pennsylvania State 1978; *assistant professor, Internal Medicine, 1986*

Field, F. Jeffrey, B.S. Wisconsin 1970, M.D. 1974; *associate professor, Internal Medicine, 1980 (1985)*

Field, Howard, B.A. St. Olaf 1956, D.D.S. Marquette 1964, M.P.H. Harvard 1969; *associate professor, Preventive and Community Dentistry, 1973*

Fielding, Linda G., B.A. Florida 1972, M.Ed. 1975, Ph.D. Illinois (Urbana) 1988; *assistant professor, Curriculum and Instruction, 1989*

Fieselmann, John F., B.S. Iowa 1968, M.D. 1972; *assistant professor, Internal Medicine 1975 (1988)*

Filer, Lloyd J., B.S. Pittsburgh 1941, Ph.D. 1944, M.D. Rochester 1952; *Mead Johnson professor emeritus, Pediatrics, 1965 (1986)*

Finamore, John F., B.A. Maryland 1972, M.A. Tufts 1975, M.A. Rutgers 1977, Ph.D. 1983; *associate professor, Classics, 1983 (1989)*

Fincham, Richard W., B.S. Iowa 1953, M.D. 1956; *professor, Neurology, 1963 (1975)*

Finkelstein, Michael, B.S. Illinois 1972, D.D.S. Iowa 1976, M.S. 1982; *associate professor, Oral Pathology and Diagnosis, 1982 (1989)*

Finn, Richard, B.A. Iowa 1950, M.A. 1952, M.D. 1959; *associate professor, Psychiatry, 1963 (1971)*

Finney, James R., B.A. Wooster 1975, Dipl. Rose Bruford College (United Kingdom) 1978, Ph.D. Northwestern 1987; *assistant professor, Theatre Arts, 1985*

Fiorito, Jack T., B.S. Illinois 1974, M.A. 1976, Ph.D. 1980; *professor, Management and Organizations, 1982 (1990)*

Fiorito, Susan S., B.S. Florida State 1973, M.S. Barry 1976, Ph.D. Oklahoma State 1984; *assistant professor, Home Economics/Curriculum and Instruction, 1983 (1984)*

Fischer, Gary W., B.S.M.E. Iowa 1964, B.A. 1964, M.S. 1966, Ph.D. 1969; *associate professor, Industrial and Management Engineering, 1985*

Fisher, Alton K., D.D.S. Marquette 1935, B.S. Loyola (Louisiana) 1948; *professor emeritus, Oral Pathology and Diagnosis/Anthropology, 1949 (1974)*

Fisher, Neil B., B.S.C.E. Iowa 1951, M.S. 1954; *assistant professor emeritus, Civil and Environmental Engineering, 1951 (1985)*

Fisher, Peter S., B.A. Haverford 1968, M.A. Missouri 1972, Ph.D. Wisconsin 1978; *associate professor, Urban and Regional Planning, 1977 (1983)*

Fisher, Rory A., B.S. Rockford 1976, Ph.D. Iowa State 1983; *assistant professor, Pharmacology, 1987*

Fisher, William S., B.S.Ph. Iowa 1979, M.S. 1985; *adjunct assistant professor, Pharmacy, 1988*

Fitch, Robert M., B.A.E. Florida 1959, M.Ed. 1961, Ph.D. Iowa 1965; *professor, Curriculum and Instruction, 1966 (1976)*

Fitz, Annette E., B.A. Iowa 1954, M.D. 1958; *professor, Internal Medicine, 1963 (1976)*

Fix, John D., B.S. Purdue 1963, M.A. Indiana 1967, Ph.D. 1969; *professor, Physics and Astronomy, 1969 (1980)*

Flanagan, Douglas R., B.S. Michigan 1967, M.S. 1969, Ph.D. 1971; *associate professor, Pharmacy, 1978*

Fleck, Arthur C., B.S. Western Michigan 1959, M.A. Michigan State 1960, Ph.D. 1964; *professor, Computer Science, 1965 (1972)*

Flynn, C. Thomas, M.B.Ch.B. Birmingham (United Kingdom) 1957; *clinical assistant professor, Internal Medicine, 1987*

Folberg, Robert, B.A. LaSalle 1971, M.D. Temple 1975; *professor, Ophthalmology/Pathology, 1984 (1990)*

Foley, Walter J., B.Ed. Chicago State 1957, M.Ed. 1961, Ed.D. Illinois 1964; *professor, Planning, Policy and Leadership Studies, 1965 (1970)*

Folk, G. Edgar, Jr., A.B. Harvard 1937, M.A. 1940, Ph.D. 1947; *professor emeritus, Physiology and Biophysics, 1953 (1985)*

Folk, James C., B.S. Penn State 1974, M.D. Thomas Jefferson 1977; *professor, Ophthalmology, 1980 (1989)*

Folkins, John W., B.A. Redlands 1970, M.S. 1971, Ph.D. Washington 1976; *professor, Speech Pathology and Audiology, 1977 (1986)*

Folsom, Ed, B.A. Ohio Wesleyan 1969, M.A. Rochester 1972, Ph.D. 1976; *professor, English, 1976 (1987)*

Fomon, Samuel J., B.A. Harvard 1947, M.D. Pennsylvania 1947; *professor, Pediatrics, 1954 (1961)*

Fonseca, Juanita M., B.S. Connecticut 1982, D.D.S. Michigan 1987; *clinical instructor, Oral Pathology and Diagnosis, 1988*

Forbes, Robert B., B.A. Alberta (Canada) 1971, M.D. 1975; *associate professor, Anesthesia, 1983 (1989)*

Forell, George W., B.D. Lutheran Theological Seminary 1942, Th.M. Princeton 1943, Th.D. Union Theological Seminary 1949, D.D. Wartburg 1967, L.H.D. Gustavus Adolphus 1974, LL.D. Upsala 1983, LL.D. Luther 1983; *Carver professor emeritus, School of Religion, 1954 (1989)*

Forkenbrock, David J., B.A. Minnesota 1965, M.U.P. Wayne State 1973, Ph.D. Michigan 1977; *professor, Urban and Regional Planning/Civil and Environmental Engineering, 1978 (1986)*

Forsyth, Robert A., B.S. St. Vincent 1959, M.A. Kent State 1963, Ph.D. Iowa 1967; *professor, Psychological and Quantitative Foundations, 1965 (1974)*

Forsythe, Eric, B.A. Dartmouth 1969, M.F.A. Carnegie-Mellon 1971, Ph.D. 1973; *associate professor, Theatre Arts, 1986*

Forsythe, Robert, B.S. Penn State 1970, M.S. Carnegie Institute of Technology 1972, M.S. Carnegie-Mellon 1974, Ph.D. 1975; *professor, Economics, 1981 (1986)*

Foster, Charles T., Jr., B.A. California (Santa Barbara) 1971, M.A. Johns Hopkins 1974, Ph.D. 1975; *associate professor, Geology, 1978 (1982)*

Foster, Stephen C., B.A. Northern Illinois 1967, M.A. Illinois 1969, Ph.D. Pennsylvania 1973; *professor, School of Art and Art History, 1974 (1987)*

Fotos, Pete G., B.A. Marshall 1974, D.D.S. West Virginia 1978, M.S. 1980; *associate professor, Oral Pathology and Diagnosis, 1988*

Found, Ernest M., B.A. Hamilton 1974, M.D. SUNY (Upstate Medical Center) 1980; *assistant professor, Orthopaedic Surgery, 1987*

Fowles, Don C., B.S. Massachusetts Institute of Technology 1961, M.A. Harvard 1965, Ph.D. 1967; *professor, Psychology, 1970 (1982)*

Fox, Marcia H., Dipl. Iowa 1953, B.S.N. 1974, M.A. 1983; *adjunct instructor, Nursing, 1988*

Fox, Margaret G., B.S. Minnesota 1933, M.A. Columbia 1940, Ph.D. Iowa 1949; *professor emeritus, Physical Education and Sports Studies, 1949 (1980)*

Fox, Stephen S., B.S. Pennsylvania 1955, M.A. Michigan 1957, Ph.D. 1960; *professor, Psychology, 1965 (1971)*

Fracassini, S. Carl, B.F.A. Denver 1936, M.F.A. Iowa 1951; *professor emeritus, School of Art and Art History, 1956 (1976)*

Francis, Jere R., B.S. Drake 1971, M.S. Minnesota 1973, Ph.D. New England (Australia) 1982; *associate professor, Accounting, 1985 (1987)*

Franck, Phyllis M., B.S.N. Iowa 1958, M.A. 1968; *associate professor emeritus, Nursing, 1968 (1990)*

Frank, Alan R., B.A. California (Los Angeles) 1963, M.A. California State (Los Angeles) 1965, Ph.D. Iowa 1970; *professor, Curriculum and Instruction, 1970 (1985)*

Frank, Louis A., B.A. Iowa 1960, M.S. 1961, Ph.D. 1964; *Carver/James A. Van Allen professor, Physics and Astronomy, 1964 (1989)*

Frank, Roslyn M., B.A. Iowa 1961, M.A. 1963, Ph.D. 1972; *professor, Spanish and Portuguese, 1968 (1988)*

Frankel, Joseph, B.A. Cornell 1956, Ph.D. Yale 1960; *professor, Biology, 1962 (1971)*

Franken, Edmund A., Jr., M.D. Oklahoma 1961; *professor, Radiology, 1979*

Franklin, Wayne, B.A. Union 1967, M.A. Pittsburgh 1968, Ph.D. 1972; *professor, English/American Studies 1973 (1982)*

Frantz, Rita, B.S.N. Marycrest 1970, M.A. Iowa 1973, Ph.D. 1978; *associate professor, Nursing, 1972 (1980)*

Franzen, Keevin J., B.A. Northern Iowa 1972, M.D. Iowa 1976; *clinical assistant professor, Pediatrics, 1980*

Fredericks, Marilee, Ph.D. Oregon 1957; *adjunct associate professor, School of Social Work, 1980 (1985)*

Fredrickson, Mary Ann, B.S.N. Iowa, M.A.; *adjunct instructor, Nursing, 1985*

Freel, Mildred I., B.S.N. Minnesota 1961, M.Ed. 1962; *associate professor, Nursing, 1962 (1977)*

Freeman, Robert J., B.A. Northern Iowa 1974, M.S.W. Iowa 1975; *adjunct instructor, School of Social Work, 1987*

Fridrich, Kirk L., B.S. Nebraska 1979, D.D.S. 1983, M.S. Iowa 1987; *assistant professor, Oral and Maxillofacial Surgery, 1988*

Friedman, Robert L., B.A. Northwestern 1970, M.D. Pennsylvania 1974; *clinical assistant professor, Family Practice, 1980*

Friedrich, H. Bruce, B.A. Wartburg 1958, M.S. Iowa 1961, Ph.D. 1963; *professor, Chemistry, 1966 (1976)*

Friedrich, Rose Marie, B.S.N. Iowa 1961, M.A. 1973; *associate professor, Nursing, 1973 (1980)*

Frisbie, David A., B.A. Wisconsin (LaCrosse) 1966, M.S. Michigan State 1969, Ph.D. 1971; *associate professor, Psychological and Quantitative Foundations, 1981 (1986)*

Fritz, David R., B.S. Iowa State 1976, D.D.S. Iowa 1980; *adjunct instructor, Prosthodontics, 1986*

Frodel, John L., B.A. Washington 1977, B.S. 1977, M.D. 1981; *assistant professor, Otolaryngology-Head and Neck Surgery, 1987*

Frohm, Richard K., B.A. Parsons 1969, M.S.W. Iowa 1975; *adjunct instructor, School of Social Work, 1989*

From, Robert P., B.A. Drake 1971, D.O. College of Osteopathic Medicine and Surgery 1974; *associate professor, Anesthesia, 1984 (1990)*

Full, Clemens A., B.S. Loras 1958, D.D.S. Iowa 1963, M.S. 1965; *professor, Pediatric Dentistry, 1963 (1975)*

Fuller, C. Fredrick, B.S. Iowa 1970, D.D.S. 1973; *adjunct instructor, Preventive and Community Dentistry, 1976*

Fuller, James L., B.A. Grinnell 1958, D.D.S. Iowa 1962, M.S. 1972; *professor, Operative Dentistry, 1967 (1980)*

Fuller, John W., A.B. San Diego State 1962, Ph.D. Washington State 1968; *professor, Urban and Regional Planning/Geography/Economics, 1979*

Fuller, Kent R., B.S. Mankato State 1960, M.S. 1962, M.A. Oregon 1965, Ph.D. 1967; *professor, Mathematics, 1967 (1975)*

Fulton, Alice B., B.S. Brown 1973, Ph.D. 1977; *associate professor, Biochemistry, 1981 (1987)*

Fumerton, Richard, B.A. Toronto (Canada) 1971, M.A. Brown 1973, Ph.D. 1974; *professor, Philosophy, 1974 (1985)*

Funk, David C., B.S. Emory 1944, M.D. 1946; *associate professor, Internal Medicine, 1952 (1961)*

Furner, Beatrice A., B.S. State University of New York 1960, M.A. Iowa 1963, Ph.D. 1967; *professor, Curriculum and Instruction, 1964 (1975)*

Furnish, William M., B.A. Iowa 1934, M.S. 1935, Ph.D. 1938; *professor emeritus, Geology, 1953 (1977)*

Fusselman, Jon M., B.A. Hastings 1971, M.D. Nebraska 1974; *clincial associate professor, Pediatrics, 1984 (1989)*

Gaburo, Kenneth L., B.M. Rochester 1948, M.M. 1949, D.M.A. Illinois 1962; *professor, School of Music, 1983*

Gaeth, Gary J., B.S. Northern Michigan 1974, M.S. Wyoming 1977, M.S. Kansas State 1980, Ph.D. 1984; *associate professor, Marketing, 1983 (1990)*

Galagan, Donald J., D.D.S. Iowa 1937, M.P.H. California School of Public Health 1950; *professor emeritus, Preventive and Community Dentistry, 1966 (1974)*

Galask, Rudolph P., A.A. Fort Dodge 1954, B.A. Drake 1959, M.D. Iowa 1964, M.S. 1967; *professor, Obstetrics and Gynecology/ Microbiology, 1970 (1978)*

Galvin, James A., B.A. Antioch 1974, M.F.A. Iowa 1977; *associate professor, English, 1983 (1987)*

Galvin, Jeffrey R., B.S. Northwestern 1971, M.D. 1975; *assistant professor, Radiology, 1988*

Gammon, Albert N., B.S. Juilliard 1949, M.A. Columbia 1950; *professor, School of Music, 1963 (1978)*

Gangeness, Leonard G., B.S. Minnesota 1943, B.S. North Dakota 1949, M.D. Illinois 1951; *clinical assistant professor, Pediatrics, 1976*

Ganske, Corrine M., B.A. Augustana (South Dakota) 1972, M.D. Iowa 1977; *clinical assistant professor, Family Practice, 1985*

Gantz, Bruce J., B.S. Iowa 1968, M.D. 1974, M.S. 1980; *professor, Otolaryngology-Head and Neck Surgery, 1980 (1987)*

Gardner, Diane L., B.S.N. Iowa 1975, M.A. 1982, Ph.D. 1986; *assistant professor, Nursing, 1982 (1986)*

Gardner, Thomas V., B.S. Pittsburgh 1955, D.D.S. 1955, M.S. Georgetown 1965; *professor, Family Dentistry/Oral and Maxillofacial Surgery, 1974 (1982)*

Garrett, Wilmer G., B.A. Iowa 1951, M.D. 1955; *clinical assistant professor, Pediatrics, 1980*

Gartner, Rosemary I., B.A. California (Santa Cruz) 1974, M.S. Wisconsin 1977, Ph.D. 1985; *assistant professor, Sociology, 1985*

Garvey, Michael J., B.A. Stanford 1968, M.D. 1971; *associate professor, Psychiatry, 1985*

Garvin, Gregory L., B.S. Tulane 1971, D.O. Kirksville 1975; *clinical assistant professor, Pediatrics, 1989*

Gatica, Juan A., Licenciado Concepcion (Chile) 1969, Ph.D. Iowa 1972; *professor, Mathematics, 1975 (1990)*

Gauron, Eugene F., A.B. Creighton 1957, M.A. Illinois 1959, Ph.D. Catholic 1962; *professor, Psychiatry, 1962 (1974)*

Gebhart, Gerald F., B.S. Illinois 1967, M.S. Iowa 1969, Ph.D. 1971; *professor, Pharmacology, 1973 (1981)*

Gelfand, Lawrence E., A.B. Western Reserve 1949, M.A. 1950, Ph.D. Washington 1958; *professor, History, 1962 (1966)*

Gelfand, Miriam J., B.A. St. Johns (China) 1946; *assistant professor, Russian, 1962 (1986)*

Georgakakos, Konstantine P., Dipl. National Technical University of Athens (Greece) 1977, M.S. Massachusetts Institute of Technology 1980, Sc.D. 1982; *associate professor, Civil and Environmental Engineering, 1986 (1989)*

Geraets, Douglas R., B.S.Ph. South Dakota State 1976, Pharm.D. Tennessee 1980; *assistant professor, Pharmacy, 1988*

Geraghty, Michael A., B.S. Notre Dame 1952, Ph.D. 1959; *associate professor, Mathematics, 1964 (1965)*

Gerber, John C., B.A. Pittsburgh 1929, M.A. 1932, Ph.D. Chicago 1941; *M. F. Carpenter professor emeritus, English, 1944 (1976)*

Gergis, Samir D., M.B.Ch.B. Cairo (Egypt) 1954, D.A. 1957, M.D. 1962, D.A. Copenhagen (Denmark) 1963; *professor, Anesthesia, 1969 (1976)*

Gerken, Kathryn C., B.S. Southern Illinois 1962, M.A. Bradley 1967, Ph.D. Southern Illinois 1974; *associate professor, Psychological and Quantitative Foundations, 1987*

Getting, Peter A., B.S. Massachusetts Institute of Technology 1967, Ph.D. California (Berkeley) 1971; *professor, Physiology and Biophysics, 1980 (1985)*

Geyer, Pamela K., B.Sc. McGill 1978, Ph.D. Ohio State 1983; *assistant professor, Biochemistry, 1989*

Gfeller, Kay E., B.M. Drake 1971, M.M. Northwestern 1974, Ph.D. Michigan State 1982; *associate professor, School of Music, 1985 (1988)*

Ghali, Magdi G.H., M.B.B.Ch. Cairo (Egypt) 1975; *clinical assistant professor, Internal Medicine, 1986*

Ghoneim, Mohamed M., M.B.B.Ch. Ein Shams (Egypt) 1957, M.D. Cairo (Egypt) 1957, F.F.A.R.C.S. London (England) 1963; *professor, Anesthesia, 1967 (1976)*

Ghosh, Anjan K., B.Tech. Indian Institute of Technology (India) 1979, M.S. SUNY-Stony Brook 1980, Ph.D. Carnegie-Mellon 1984; *assistant professor, Electrical and Computer Engineering, 1987*

Ghosh, Sukumar, B.Sc. Calcutta 1964, B.Tech. 1966, M.Tech 1967, Ph.D. 1971; *associate professor, Computer Science, 1984 (1989)*

Giblin, James L., A.B. McGill 1975, M.A. 1978, Ph.D. Wisconsin (Madison) 1986; *assistant professor, History/African-American World Studies, 1986*

Gibson, David T., B.Sc. Leeds (United Kingdom) 1961, Ph.D. 1964; *Foundation professor of Biocatalysis, Microbiology, 1988*

Gibson, Jon D., B.A. Iowa 1979, M.S. 1973, M.D. 1973; *clinical assistant professor, Internal Medicine, 1987*

Giesey, Ralph E., A.B. Wayne State 1944, M.A. 1947, Ph.D. California (Berkeley) 1954; *professor emeritus, History, 1966 (1988)*

Gilbert, Miriam A., B.A. Brandeis 1965, M.A. Indiana 1967, Ph.D. 1969; *professor, English, 1969 (1982)*

Giller, Roger H., B.A. Northwestern 1972, M.D. Medical College of Wisconsin 1976; *assistant professor, Pediatrics, 1983 (1985)*

Gilliland, James L., B.S. Michigan State 1969, D.O. Kirksville Osteopathic 1973; *clinical assistant professor, Internal Medicine, 1983*

Gilmer, Jerry S., M.S. Arizona 1973, M.S. Iowa 1979, Ph.D. 1981; *adjunct assistant professor, Psychological and Quantitative Foundations, 1989*

Gilroy, Thomas P., B.S. St. Peter's 1956, M.I.L.R. Cornell 1958; *associate professor, Management and Organizations, 1972 (1973)*

Ginder, Gordon D., B.S. Illinois 1971, M.D. Johns Hopkins 1975; *professor, Internal Medicine, 1980 (1989)*

Gingrich, Roger D., B.A. Macalaster 1970, M.D. Cornell 1974, Ph.D. Oxford 1981; *associate professor, Internal Medicine, 1981 (1986)*

Gisolfi, Carl V., B.S. Manhattan 1964, Ph.D. Indiana 1969; *professor, Exercise Science/Physiology and Biophysics 1969 (1981)*

Gittler, Josephine, B.A. Barnard 1965, J.D. Northwestern 1968; *professor, Law, 1973 (1977)*

Gius, John A., B.A. Oregon 1931, M.D. 1934, D.Sc. Columbia 1939; *professor emeritus, Surgery, 1952 (1972)*

Gjerde, Craig L., B.A. North Dakota 1964, M.Ed. 1968, Ph.D. Illinois 1974; *associate professor, Family Practice/Psychological and Quantitative Foundations, 1980 (1982)*

Glasgow, Robert O., B.F.A. Wittenberg 1967, M.A. Wisconsin 1968, M.F.A. 1969; *associate professor, School of Art and Art History, 1985 (1989)*

Glass, Beaumont, Jr., B.S. U.S. Naval Academy 1949; *professor, School of Music, 1980 (1984)*

Glasser, James E., B.S. Wheaton 1960, M.D. Johns Hopkins 1964; *clinical instructor, Internal Medicine, 1988*

Glazier, Adam J., Jr., B.S. Iowa 1974, M.D. 1979; *clinical assistant professor, Internal Medicine, 1987*

Glenister, Brian F., B.Sc. Western Australia 1948, M.S. Melbourne (Australia) 1953, Ph.D. Iowa 1956; *A. K. Miller professor, Geology, 1959 (1966)*

Glick, Frank Z., A.B. Kansas 1927, A.M. Chicago 1930, Ph.D. 1939; *professor emeritus, School of Social Work, 1962 (1971)*

Glick, Orpha J., B.S. Eastern Mennonite 1960, Iowa 1965, M.A. 1967, Ph.D. 1982; *assistant professor, Nursing, 1967 (1969)*

Gloer, James B., B.S. Florida 1978, Ph.D. Illinois 1983; *associate professor, Chemistry, 1984 (1990)*

Gloor, Eileen, B.S.N. Georgetown 1969, M.S.N. Yale 1971; *adjunct instructor, Nursing, 1986*

Godwin, Robert F., B.A. Iowa 1963, M.D. 1966; *clinical assistant professor, Dermatology, 1976*

Goeken, James A., A.B. Chicago 1967, M.D. Missouri 1972; *professor, Pathology, 1976 (1990)*

Goeken, Nancy E., B.A. Missouri 1968, Ph.D. 1972; *associate professor, Internal Medicine/Pathology, 1983 (1986)*

Goel, Vijay K., B.E. Panjabi (India) 1966, M.E. Roorke (India) 1971, Ph.D. New South Wales (Australia) 1977; *professor, Biomedical Engineering/Mechanical Engineering, 1982 (1990)*

Goepferd, Stephen J., B.S. Minnesota 1973, D.D.S. 1973, M.S. 1978; *professor, Pediatric Dentistry, 1978 (1989)*

Goertz, Christoph K., Diplom Physiker Technische Universität Berlin (Germany) 1969, Ph.D. Rhodes (South Africa) 1972; *professor, Physics and Astronomy, 1973 (1981)*

Goff, Harold M., B.S. Missouri 1969, M.A. 1971, Ph.D. Texas 1976; *professor, Chemistry, 1976 (1985)*

Goff, Lewin A., B.A. Oklahoma 1941, M.F.A. 1946, Ph.D. Western Reserve 1948; *professor emeritus, Theatre Arts, 1973 (1986)*

Goldstein, Helen T., B.A. Chicago 1948, A.M. Radcliffe 1951, Ph.D. 1956; *associate professor, School of Religion, 1968 (1980)*

Goldstein, Jonathan A., A.B. Harvard 1950, A.M. 1951, Ph.D. Columbia 1959, D. Hebrew Lett. Jewish Theological Seminary of America 1988; *professor, History/Classics, 1962 (1970)*

Gomez, Mark N., B.S. Wisconsin (Madison) 1978, M.D. 1982; *assistant professor, Anesthesia, 1989*

Gonzalez, Luis A., B.S. Puerto Rico 1978, M.S. Michigan 1983, Ph.D. 1989; *assistant professor, Geology, 1989*

González, Nora M., B.A. Chile 1966, M.A. San Diego State 1978, M.A. California (San Diego) 1980, Ph.D. 1985; *associate professor, Spanish and Portuguese, 1985 (1990)*

Good, W. Stanley, A.B. Nebraska Wesleyan 1937, M.S.S.W. Nebraska 1948; *associate professor emeritus, School of Social Work, 1966 (1980)*

Goodman, Frederick, A.B. Harvard 1971, A.M. 1971, Ph.D. California (Berkeley) 1979; *professor, Mathematics, 1984 (1990)*

Goodrich, John L., D.D.S. Iowa 1979, M.S. Nebraska 1966; *adjunct assistant professor, Preventive and Community Dentistry, 1985*

Goodridge, Alan G., B.S. Tufts 1958, M.S. Michigan 1963, Ph.D. 1964; *professor, Biochemistry, 1987*

Goplerud, Clifford P., M.D. Iowa 1948; *professor, Obstetrics and Gynecology, 1958 (1966)*

Gordon, David F., A.B. Western Reserve 1958, M.D. New York 1962; *clinical assistant professor, Internal Medicine, 1973*

Gordon, Joel A., B.A. Colorado (Boulder) 1972, M.D. Colorado (Denver) 1976; *assistant professor, Internal Medicine, 1987*

Goree, John A., B.S. California Institute of Technology 1980, M.A. Princeton 1982, Ph.D. 1985; *assistant professor, Physics and Astronomy, 1985*

Gormezano, Isidore, A.B. New York 1952, A.M. Wisconsin 1957, Ph.D. 1958; *professor, Psychology, 1966*

Gould, Marjorie L., B.S. Iowa 1939, M.S. Boston 1947; *associate professor emeritus, Nursing, 1967 (1979)*

Graham, Jorie P., B.F.A. New York 1973, M.F.A. Iowa 1978; *associate professor, English, 1983 (1987)*

Grandquist, Betty, B.A. Drake 1974, M.S.W. Iowa 1976; *adjunct instructor, Social Work, 1985*

Grant, Christine, Dipl. Dumferline (Scotland) 1956, B.A. Iowa 1970, Ph.D. 1974; *associate professor, Physical Education and Sports Studies, 1971 (1979)*

Grant, John E., A.B. Harvard 1951, A.M. 1954, Ph.D. 1960; *professor, English, 1965*

Grassian, Vicki H., B.S. State University New York (Albany) 1981, M.S. Rensselaer Polytechnic 1982, Ph.D. University of California (Berkeley) 1987; *assistant professor, Chemistry, 1990*

Gray, Steven D., B.S. Brigham Young 1977, M.D. Utah 1982, M.S. Iowa 1986; *assistant professor, Otolaryngology, 1987*

Green, Michael D., B.S. Tufts 1972, J.D. Pennsylvania 1975; *professor, Law, 1980 (1985)*

Green, Steven H., B.S. Wisconsin 1975, Ph.D. California Institute of Technology (Pasadena) 1982; *assistant professor, Biology, 1987*

Green, William, A.B. Grinnell 1974, M.A. Wisconsin (Madison) 1977, Ph.D. 1987; *adjunct assistant professor, Anthropology, 1988*

Greenberg, Everett P., B.A. Western Washington 1970, M.S. Iowa 1972, Ph.D. Massachusetts 1977; *professor, Microbiology, 1988 (1990)*

Greenhoe, David S., B.M. Eastman School of Music 1964, M.M. Ball State 1969; *professor, School of Music, 1979 (1989)*

Greenough, Paul R., B.S. Columbia 1968, M.A. Chicago 1970, Ph.D. 1977; *professor, History, 1974 (1987)*

Greenswag, Louise R., B.S.N. Keuka 1950, M.A. Iowa 1975, Ph.D. 1984; *adjunct assistant professor, Nursing, 1986*

Greer, Willis R., Jr., B.S. Cornell 1961, M.B.A. 1966, Ph.D. Michigan 1971; *professor, Accounting, 1988*

Greydanus, Donald E., B.S. Calvin 1966, M.D. College of Medicine and Surgery of New Jersey 1971; *clinical professor, Pediatrics, 1984 (1990)*

Grignon, Constance, B.S.C. McGill (Canada) 1969, M.D.C.M. 1973; *clinical assistant professor, Ophthalmology, 1988*

Grigsby, William R., B.A. Dartmouth 1956, D.D.S. Missouri 1960, Ph.D. Virginia Commonwealth 1970; *associate professor, Periodontics, 1973*

Grimlund, Richard A., B.S. Washington 1959, M.B.A. 1974, Ph.D. 1977; *associate professor, Accounting, 1978 (1983)*

Grinstead, Dan M., B.A. Wartburg 1972, M.S.W. Minnesota (Duluth) 1975; *adjunct instructor, School of Social Work/Obstetrics and Gynecology, 1979*

Gronbeck, Bruce E., B.A. Concordia 1963, M.A. Iowa 1966, Ph.D. 1970; *professor, Communication Studies, 1973 (1979)*

Grose, Charles, B.A. Beloit 1963, M.D. Chicago 1967; *professor, Pediatrics, 1984 (1987)*

Grover-McKay, Maleah, B.A. Stanford 1972, M.D. 1977; *assistant professor, Internal Medicine/Radiology, 1988*

Groze, Victor K., B.A. Tulsa 1979, M.S.W. Oklahoma 1984, Ph.D. 1987; *assistant professor, School of Social Work, 1988*

Guentner, Wendelin A., B.A. St. Teresa 1972, Magis. Paris 1974, M.A. Delaware 1975, Ph.D. Chicago 1982; *associate professor, French and Italian, 1985 (1988)*

Guiang, Sixto, M.D. Santo Tomas (Philippines) 1951; *clinical assistant professor, Pediatrics, 1975*

Guillory, J. Keith, B.S. Loyola (Louisiana) 1956, M.S. Wisconsin 1960, Ph.D. 1961; *professor, Pharmacy, 1964 (1971)*

Gurll, Nelson J., A.B. California (Berkeley) 1963, M.D. California (San Francisco) 1967; *professor, Surgery, 1976 (1983)*

Gurnett, Donald A., B.S.E.E. Iowa 1962, M.S. 1963, Ph.D. 1965; *Carver/James A. Van Allen professor, Physics and Astronomy, 1965 (1989)*

Gussin, Gary N., B.S. Michigan 1961, Ph.D. Harvard 1966; *professor, Biology, 1969 (1980)*

Gutterman, David D., B.A. North Carolina 1976, M.D. 1980; *assistant professor, Internal Medicine, 1987*

Habak, Philip A., M.B.B.Ch. Ain-Shams (Egypt) 1963; *clinical assistant professor, Internal Medicine 1973 (1977)*

Hackbarth, Stanley A., B.A. Northern Iowa 1970, M.D. Iowa 1977; *clinical assistant professor, Pediatrics, 1981*

Haefner, John., B.A. Iowa 1935, M.A. 1939, Ph.D. 1941; *professor emeritus, Curriculum and Instruction, 1941 (1982)*

Hagle, Timothy M., B.A. Michigan State 1978, B.S. 1978, J.D. Cooley Law School 1982, M.A. Michigan State 1985, Ph.D. 1988; *assistant professor, Political Science, 1988*

Hahn, Oscar A., Ph.D. Chile 1963, M.A. Iowa 1972, Ph.D. Maryland 1977; *professor, Spanish and Portuguese, 1977 (1983)*

Haines, Don R., B.M. Illinois Wesleyan 1959, M.M. Eastman School of Music 1961, D.M.A. Rochester 1973; *associate professor, School of Music, 1974 (1978)*

Hale, Charles A., B.A. Amherst 1951, M.A. Minnesota 1952, Diplome Strasbourg (France) 1953, Ph.D. Columbia 1957; *professor, History, 1966 (1970)*

Hale, Lenore R., B.A. Mount Holyoke 1951, M.S.W. Iowa 1973; *adjunct instructor, Social Work, 1986*

Hale, Merle L., D.D.S. Iowa 1938, B.A. 1948, M.S. 1949; *professor emeritus, Oral and Maxillofacial Surgery, 1952 (1979)*

Hall, Daniel L., B.A. Iowa 1955, D.D.S. 1959, M.S 1974; *professor, Family Dentistry, 1971 (1985)*

Hall, Geraldine R., B.S.E. Temple 1970, M.A. Iowa 1988; *adjunct instructor, Nursing, 1989*

Hall, Margaret S., B.A. Smith 1938, M.F.A. Iowa 1951; *associate professor emeritus, Theatre Arts, 1951 (1978)*

Hall, Penelope J., B.A. Iowa 1965, M.A. 1967; *assistant professor, Speech Pathology and Audiology, 1968 (1975)*

Hallberg, George R., A.B. Augustana 1970, Ph.D. Iowa 1975; *adjunct professor, Geology, 1976*

Halm, Margo A., B.S.N. Iowa 1985, M.A. 1987; *adjunct instructor, Nursing, 1989*

Hamdan-Allen, Ghada A., B.S. American University of Beirut 1977, M.D. 1982; *assistant professor, Psychiatry, 1988 (1989)*

Hamilton, David B., A.B. Amherst 1961, M.A. Virginia 1964, Ph.D. 1968; *professor, English, 1975 (1982)*

Hammond, Harold L., D.D.S. Loyola University of Chicago 1962, M.S. Chicago 1967; *professor, Oral Pathology and Diagnosis, 1967 (1983)*

Hamre-Nietupski, Susan M., B.S. Wisconsin (Madison) 1972, M.S. 1974, Ph.D. 1978; *assistant professor, Curriculum and Instruction, 1990*

Hand, Jed S., B.S. Bowling Green 1967, D.D.S. Michigan 1970, M.H.S.A. 1980; *associate professor, Preventive and Community Dentistry, 1982 (1988)*

Hankenson, Richard R., M.D. Iowa 1969; *clinical assistant professor, Internal Medicine, 1976*

Hanley, Sarah, B.A. Pittsburgh 1967, M.A. Iowa 1970, Ph.D. 1975; *professor, History, 1976 (1987)*

Hanna, George E., D.D.S. Iowa 1982; *adjunct assistant professor, Oral Pathology and Diagnosis, 1986*

Hansell, Sven H., B.F.A. Pennsylvania 1956, M.A. Harvard 1958, Ph.D. Illinois 1966; *professor, School of Music, 1973 (1981)*

Hansen, Gary F., B.A. Iowa 1957, M.A. 1959, Ph.D. 1964; *associate professor, Exercise Science/Curriculum and Instruction, 1962 (1969)*

Hansen, James R., B.S. Portland State 1975, M.D. Oregon Health Sciences 1982; *assistant professor, Pediatrics, 1988*

Hansen, Paula Jo, B.S.Ph. Iowa 1981, M.S. 1984; *clinical assistant professor, Pharmacy, 1984 (1986)*

Hansen, Richard F., B. Arch. Iowa State 1955; *adjunct assistant professor, Hospital and Health Administration, 1987*

Hanson, James W., M.D. Iowa 1969; *professor, Pediatrics, 1976 (1984)*

Hanson, Randall R., B.S. Iowa State 1965, M.D. Iowa 1969; *clinical assistant professor, Internal Medicine, 1974 (1977)*

Hardt, Hanno R. E., M.A. Southern Illinois 1963, Ph.D. 1967; *John F. Murray professor, School of Journalism and Mass Communication, 1968 (1974)*

Hardy, James C., B.S. Northeast Missouri State Teachers 1951, M.A. Iowa 1957, Ph.D. 1961; *professor, Pediatrics/Speech Pathology and Audiology, 1961 (1969)*

Hardy, Mary A., B.S.N. Saint Scholastica 1969, M.A. Iowa 1976, Ph.D. 1985; *assistant professor, Nursing, 1982 (1985)*

Harker, Lee A., B.A. Iowa 1961, M.D. 1964; *professor, Otolaryngology-Head and Neck Surgery, 1970 (1979)*

Harley, Roy A., B.A. Toledo 1970, M.A. Illinois (Urbana-Champaign) 1973, Ph.D. 1978; *adjunct instructor, School of Social Work, 1986*

Harlow, John S., B.A. Princeton 1935, J.D. Harvard 1939; *professor emeritus, Management and Organizations, 1957 (1982)*

Harper, Dennis C., B.A. Augustana 1964, M.A. Iowa 1966, Ph.D. 1972; *professor, Pediatrics, 1972 (1985)*

Harper, John B., A.B. Stanford 1962, M.B.A. Iowa 1966; *assistant professor, English, 1976 (1982)*

Harris, Deborah J., B.S. Central Michigan 1977, M.A. 1979, Ph.D. Wisconsin (Madison) 1983; *adjunct assistant professor, Psychological and Quantitative Foundations, 1987*

Harris, James L., B.S. Georgia Tech 1941, M.Arch. Harvard 1950, M.C.P. 1952; *professor emeritus, Urban and Regional Planning, 1967 (1989)*

Hart, Laura K., B.S.N. St. Teresa 1960, M.Ed. Minnesota 1962, Ph.D. Iowa 1971, M.A. 1972; *associate professor, Nursing, 1972*

Hart, Linda, B.A. Minnesota 1969, M.S.W. Iowa 1973; *adjunct instructor, School of Social Work, 1982*

Hart, Michael N., B.A. St. Ambrose 1961, M.D. Marquette 1965; *professor, Pathology, 1975 (1980)*

Hartman, Gerhard, B.A. Buffalo 1932, M.B.A. 1935, Ph.D. Chicago 1942; *professor emeritus, Hospital and Health Administration, 1946 (1979)*

Harvey, Brien V., B.S. Minnesota 1977, D.D.S. Iowa 1981, M.S. 1983; *adjunct assistant professor, Periodontics, 1983 (1987)*

Harvey, John H., B.S. South Carolina 1968, M.A. Missouri 1970, Ph.D. 1971; *professor, Psychology, 1986*

Harwood, Caroline S., B.A. Colby 1973, M.A. Boston 1976, Ph.D. Massachusetts (Amherst) 1982; *assistant professor, Microbiology, 1988*

Hass, A. Curtis, B.S. Stanford 1956, M.D. Iowa 1960; *clinical associate professor, Radiology, 1967 (1981)*

Hatcher, William B., B.M.E. Nebraska (Lincoln) 1957, M.Mus. 1960; *associate professor, School of Music, 1988*

Haug, Edward J., B.S. Missouri 1962, M.S. Kansas State 1964, Ph.D. 1966; *professor, Mechanical Engineering/Civil and Environmental Engineering, 1968 (1976)*

Hauge, Kathy J., B.S.Pharm. Iowa 1982, Pharm.D. 1985; *clinical assistant professor, Pharmacy, 1988*

Hauserman, Nancy R., B.A. Rhode Island 1971, J.D. Iowa 1976; *associate professor, Management and Organizations, 1977 (1983)*

Hauster, William J., B.A. Kansas 1951, M.A. 1953, Ph.D. 1958; *professor, Preventive Medicine and Environmental Health/Oral Pathology and Diagnosis, 1958 (1990)*

Haw, Richard C., B.A. Iowa 1949, M.S. 1951, D.D.S. 1955; *adjunct assistant professor, Periodontics, 1990*

Hawes, Donald R., B.A. Indiana 1963, M.D. 1966; *assistant professor, Radiology, 1988 (1989)*

Hawkins, Benny F., B.S. Morehouse 1952, D.D.S. Meharry 1958, M.S. Iowa 1972; *associate professor, Periodontics, 1978*

Hawks, James, B.S. Iowa 1985, D.D.S. 1985; *adjunct instructor, Preventive and Community Dentistry, 1989*

Hawley, Ellis W., B.A. Wichita 1950, M.A. Kansas 1951, Ph.D. Wisconsin 1959; *professor, History, 1969*

Hawn, Sharon K., B.A. Northern Iowa 1968, M.Ed. Colorado State 1975; *adjunct instructor, Nursing, 1988*

Hawtrey, Charles E., B.A. Grinnell 1957, M.D. Iowa 1961; *professor, Urology, 1969 (1977)*

Hay, James G., Dip.P.E. Otago (New Zealand) 1956, M.A. Iowa 1965, Ph.D. 1967; *professor, Exercise Science, 1971 (1978)*

Hayles, N. Katherine, B.S. Rochester 1966, M.S. California Institute of Technology 1969, M.A. Michigan State 1970, Ph.D. Rochester 1977; *Millington F. Carpenter professor, English, 1985 (1990)*

Hayreh, Sant M., M.B.B.S. Punjab (India) 1970; *clinical assistant professor, Neurology, 1983*

Hayreh, Sohan S., M.B.B.S. Punjab (India) 1951, M.S. 1959, Ph.D. London (England) 1965, D.Sc. 1987; *professor, Ophthalmology, 1973*

Healy, Alfred, B.S. Notre Dame 1956, M.A. Iowa 1957, M.D. 1963; *professor, Pediatrics/ Curriculum and Instruction, 1967 (1980)*

Heath, James W., B.A. Iowa 1952, D.D.S. 1956; *adjunct assistant professor, Preventive and Community Dentistry, 1988*

Heckel, Philip H., B.A. Amherst 1960, Ph.D. Rice 1966; *professor, Geology, 1971 (1978)*

Heddens, Heather B., D.D.S. Iowa 1980; *adjunct assistant professor, Family Dentistry, 1987*

Hedge, Herbert R., D.D.S. Iowa 1957; *adjunct assistant professor, Family Dentistry, 1986 (1989)*

Hedley, Robert, B.Ed. Alberta 1960, M.F.A. Texas 1963; *professor, Theatre Arts, 1981*

Heffner, Ray L., A.B. Yale 1948, M.A. 1950, Ph.D. 1953, Litt.D. Franklin 1966, LL.D. Rhode Island 1967, D.B.A. Bryant 1967; *professor, English, 1963*

Hegmann, Joseph P., B.S. Illinois 1962, M.S. 1965, Ph.D. 1968; *professor, Biology, 1968 (1977)*

Heick, Merle A., B.S.N. Iowa 1960, M.Ed. Minnesota 1963; *assistant professor emeritus, Nursing, 1960 (1988)*

Heidger, Paul M., B.A. Northern Colorado 1963, Ph.D. Tulane 1967; *professor, Anatomy, 1974 (1979)*

Heilenman, L. Kathy, B.A. Kentucky Southern 1968, M.A. Louisville 1970, Ph.D. 1978; *associate professor, French and Italian, 1989*

Hein, Herman A., B.A. Wartburg 1959, M.D. Iowa 1963; *professor, Pediatrics, 1973 (1981)*

Heistad, Donald D., B.S. Chicago 1959, M.D. 1963; *professor, Internal Medicine/ Pharmacology, 1970 (1976)*

Hellyer, Lyle A., B.S. Northeast Missouri State 1951, M.S. 1956, Ed.S. Drake 1971, Ed.D. 1975; *adjunct assistant professor, Planning, Policy and Leadership Studies, 1987*

Helm, June, Ph.B. Chicago 1944, A.M. 1949, Ph.D. 1958; *professor, Anthropology, 1960 (1967)*

Helms, Charles M., A.B. Cornell 1964, Ph.D. Rochester 1969, M.D. 1971; *associate professor, Internal Medicine, 1976 (1982)*

Helms, Lelia B., B.A. Sarah Lawrence 1964, M.A. Tufts 1966, Ph.D. 1968, J.D. Iowa 1984; *assistant professor, Planning, Policy and Leadership Studies, 1979 (1988)*

Helscher, John W., D.D.S. Iowa 1971; *adjunct assistant professor, Operative Dentistry, 1973 (1984)*

Hempel, Stephen L., B.S. St. Johns 1977, M.D. Minnesota 1982; *assistant professor, Internal Medicine, 1989 (1990)*

Henderson, Mae G., B.A. Carleton 1968, M.A. Yale 1973, M.Phil. 1976, Ph.D. 1983; *associate professor, English/African-American World Studies, 1985 (1986)*

Hendrickson, Jo M., B.A. Wisconsin (Madison) 1969, M.A. 1971, Ph.D. George Peabody 1977; *associate professor, Curriculum and Instruction, 1989*

Hendrix, James A., B.S. Iowa State 1971, M.D. Iowa 1974; *clinical assistant professor, Pediatrics, 1980*

Hendrix, Stephen D., B.S. Florida State 1969, Ph.D. California (Berkeley) 1975; *associate professor, Botany, 1975 (1982)*

Henkin, Alan B., B.S. Alabama 1962, M.A. 1963, Ph.D. 1967, Ph.D. Wisconsin 1972; *professor, Planning, Policy and Leadership Studies, 1975 (1985)*

Hensley, Carl E. II, B.S.Ph. Iowa 1977; *adjunct instructor, Pharmacy, 1988*

Hering, Robert G., B.S.M.E. Illinois 1956, M.S.M.E. Southern California 1958, Ph.D. Purdue 1961; *professor, Mechanical Engineering, 1971*

Herlitzka, Alfred J., B.S. Wisconsin 1947, M.D. 1951; *clinical associate professor, Surgery, 1974 (1985)*

Herman, Ronald A., B.S.Ph. Iowa 1976, M.S. 1978; *clinical instructor, Pharmacy, 1990*

Herr, Cheryl T., B.A. Duke 1971, M.A. North Carolina 1974, Ph.D. 1978; *associate professor, English, 1985*

Herr, Keela, B.S.N. Northeast Missouri 1976, M.S.N. Texas (Austin) 1977, Ph.D. 1986; *assistant professor, Nursing, 1987*

Hervig, Richard B., B.A. Augustana 1939, M.A. Iowa 1941, Ph.D. 1947; *professor emeritus, School of Music, 1947 (1988)*

Hesson, William W., B.S. Iowa 1971, J.D. 1979; *adjunct assistant professor, Hospital and Health Administration, 1984*

Hethcote, Herbert W., B.S. Colorado 1964, M.A. Michigan 1965, Ph.D. 1968; *professor, Mathematics, 1969 (1979)*

Hetherington, Cheryl, B.S. Kansas State 1971, M.S. 1972, Ph.D. Pennsylvania State 1978; *adjunct assistant professor, Counselor Education, 1984*

Hettmansperger, Sue E., B.F.A. New Mexico 1972, M.F.A. 1974; *associate professor, School of Art and Art History, 1977 (1983)*

Hichwa, Richard D., B.S. Notre Dame 1975, M.S. Wisconsin (Madison) 1977, Ph.D. 1981; *associate professor, Radiology, 1988*

Hicklin, Gregory A., B.S. Iowa 1972, M.D. 1976; *clinical assistant professor, Internal Medicine, 1986*

Hieronymus, Albert N., B.Ed. Illinois State 1939, M.A. Iowa 1946, Ph.D. 1948; *professor emeritus, Psychological and Quantitative Foundations, 1948 (1987)*

Higa, Leslie, B.A. Grinnell 1953, D.D.S. Missouri 1960, M.S. Chicago 1965; *professor, Oral and Maxillofacial Surgery, 1965 (1978)*

Higuchi, Kenji W., D.D.S. Marquette 1969, M.S. Iowa 1976; *adjunct assistant professor, Oral and Maxillofacial Surgery, 1989*

Hill, John D., B.S. Wayne State 1950, M.M. Indiana 1956, Ph.D. Kansas 1968; *professor, School of Music, 1963 (1975)*

Hill, Pamela, B.S.N. Marycrest 1973, M.S.N. Northern Illinois 1976, Ph.D. Iowa 1985; *adjunct assistant professor, Nursing, 1986*

Hindes, Charles A., B.F.A. Illinois 1966, M.F.A. Rhode Island School of Design 1968; *professor, School of Art and Art History, 1973 (1985)*

Hines, N. William, A.B. Baker 1958, LL.B. Kansas 1961; *Joseph F. Rosenfield professor, Law, 1962 (1967)*

Hingtgen, Richard J., B.S. Loras 1953, D.D.S. Iowa 1957; *adjunct assistant professor, Family Dentistry, 1978 (1983)*

Hinrichs, James V., B.A. Iowa 1963, A.M. Stanford 1964, Ph.D. 1967; *professor, Psychology, 1967 (1978)*

Hirokawa, Randy Y., B.A. Hawaii 1975, M.A. Washington 1977, Ph.D. 1980; *associate professor, Communication Studies, 1984 (1988)*

Hirsch, Norma J., B.S. Iowa State 1966, M.D. Iowa 1970; *clinical assistant professor, Pediatrics, 1980*

Hitchcock, Orville A., B.A. Pennsylvania State 1931, M.A. Iowa 1932, Ph.D. 1936; *professor emeritus, Communication Studies, 1946 (1976)*

Hitchon, Patrick W., B.S. American University of Beirut (Lebanon) 1969, M.D. 1974; *professor, Surgery, 1980 (1989)*

Hoch, Steven L., B.A. Trinity 1973, M.A. Princeton 1975, Ph.D. 1983; *associate professor, History, 1987 (1989)*

Hoffman, Frances M., B.A. Carleton 1973, M.A. Iowa 1978; *adjunct assistant professor, Nursing, 1982 (1988)*

Hoffmann, Louis G., B.A. Wesleyan 1953, M.S. Johns Hopkins 1958, S.C.D. 1960; *professor, Microbiology, 1964 (1973)*

Hofmann, Ronald J., B.A. Iowa 1953, M.D. Mexico 1960; *clinical assistant professor, Ophthalmology, 1979 (1988)*

Hofmann, William B., B.S. St. Ambrose 1949, M.D. Mexico 1959; *clinical assistant professor, Ophthalmology, 1979 (1988)*

Hogg, Robert V., B.A. Illinois 1947, M.S. Iowa 1948, Ph.D. 1950; *professor, Statistics and Actuarial Science, 1948 (1962)*

Hohle, Raymond H., A.B. Nevada 1954, M.S. Oregon 1956, Ph.D. 1961; *associate professor, Psychology, 1961 (1965)*

Holcomb, Richard L., B.S. Iowa State 1933, M.A. Iowa 1936; *associate professor emeritus, Bureau of Police Science, 1945 (1982)*

Holliday, Ruth, B.S.W. Our Lady of the Lake 1978, M.S.W. 1980; *adjunct instructor, School of Social Work, 1988*

Holly, Forrest M., Jr., B.S. Stanford 1968, M.S. Washington 1969, Ph.D. Colorado State 1975; *professor, Civil and Environmental Engineering, 1982 (1990)*

Holmes, David C., B.S. Iowa 1973, D.D.S. 1978; *clinical instructor, Family Dentistry, 1986*

Holstein, Jay A., A.B. Temple 1960, M.A. Hebrew Union 1966, Ph.D. 1970; *J.J. Mallon professor, School of Religion, 1970 (1982)*

Holtsmark, Erling B., B.A. California (Berkeley) 1959, Ph.D. 1963; *professor, Classics, 1963 (1982)*

Holzaepfel, Norman R., B.S. Michigan 1941, M.A. Colorado State 1948; *associate professor emeritus, Exercise Science, 1948 (1983)*

Honey, Rex D., B.A. California (Riverside) 1967, M.A. Minnesota 1969, Ph.D. 1972; *associate professor, Geography, 1974 (1978)*

Honnold, Judith, B.S.N. Iowa 1965, M.A. Iowa 1967; *adjunct assistant professor, Nursing, 1982*

Hood, Albert B., B.A. New Hampshire 1951, Ed.D. Cornell 1957; *professor, Counselor Education, 1965*

Hootman, Richard S., B.A. Coe 1947, M.A. Iowa 1951, Ph.D. 1976; *associate professor emeritus, Rhetoric/English, 1967 (1984)*

Hoover, Hiram D., B.S. Missouri 1962, M.A. Iowa 1964, Ph.D. 1969; *professor, Psychological and Quantitative Foundations, 1967 (1980)*

Hope, Felicia, B.A. Iowa 1950, M.A. 1974; *adjunct assistant professor, Nursing, 1987*

Hope, Geoffrey R., B.A. Johns Hopkins 1969, M.Ed. Temple 1971, M.A. Pennsylvania 1975, Ph.D. 1979, *associate professor, French and Italian/Curriculum and Instruction, 1978 (1984)*

Hoppin, Richard A., B.A. Minnesota 1943, M.A. 1947, Ph.D. California Institute of Technology 1951; *professor, Geology, 1951 (1961)*

Hornick, Douglas B., B.S. St. Lawrence 1978, M.D. Maryland 1982; *assistant professor, Internal Medicine, 1989 (1990)*

Hornsby, Jessie L., B.A. Toronto (Canada) 1939, M.A. 1949, Ph.D. 1956; *professor emeritus, French and Italian, 1956 (1986)*

Hornsby, Roger A., B.A. Western Reserve 1949, M.A. Princeton 1951, Ph.D. 1952; *professor, Classics, 1954 (1967)*

Horowitz, Joel L., B.S. Stanford 1962, Ph.D. Cornell 1967; *professor, Geography, 1982 (1987)*

Horton, Diana G., B.Ed. Alberta (Canada) 1972, Ph.D. 1981; *associate professor, Botany, 1983 (1989)*

Horton, Philip S., B.A. Iowa 1947, D.D.S. 1950, M.S. 1971; *associate professor emeritus, Oral Pathology and Diagnosis, 1969 (1986)*

Horwitz, Henry G., B.A. Haverford 1959, Ph.D. Oxford (England) 1963; *professor, History, 1963 (1970)*

Horwitz, Richard P., B.A. Pennsylvania 1971, M.A. 1972, Ph.D. 1975; *professor, American Studies, 1977 (1988)*

Hospers, Colee, R.N. Iowa Methodist 1962; *adjunct assistant professor, Nursing, 1987*

Houser, Doris M., B.S. Iowa 1959, M.A. 1973; *adjunct assistant professor, Nursing, 1985*

Hovenkamp, Herbert, M.A. Texas 1971, Ph.D. 1976, J.D. 1978; *professor, Law, 1986*

Howard, Robert P., B.A. McGill (Canada) 1932, M.D. 1937, M.S. 1947; *clinical professor, Family Practice, 1982*

Howe, Clifford E., B.A. Iowa 1949, M.A. 1953, Ph.D. 1958; *professor emeritus, Curriculum and Instruction, 1966 (1988)*

Hoyle, Classie G., Ph.D. Iowa 1977; *adjunct associate professor, Preventive and Community Dentistry, 1979 (1987)*

Hsu, Shu Ying, B.S. Peking National Normal (China) 1940, Ph.D. Iowa 1957; *professor, Preventive Medicine and Environmental Health, 1958 (1973)*

Hu, Hung-Shu, B.Sc. Cheng-Kung (Taiwan) 1959, M.F.A. Cranbrook Academy of Art 1966; *professor, School of Art and Art History, 1968 (1982)*

Hubbard, Mary, B.S.W. Marycrest 1978, M.S.W. Iowa 1982; *adjunct instructor, School of Social Work, 1988*

Hubbard, Philip G., B.S.E.E. Iowa 1946, M.S. 1949, Ph.D. 1954; *professor, Mechanical Engineering, 1945 (1959)*

Hubel, Kenneth A., B.A. Rochester 1950, M.D. Cornell 1954; *professor, Internal Medicine, 1962 (1973)*

Huber, Lawrence, D.D.S. Creighton 1960; *clinical assistant professor, Prosthodontics, 1971 (1981)*

Hughes, Lowell R., B.A. Ohio Wesleyan 1950, M.Ph. Johns Hopkins 1965, M.D. Ohio State 1954; *associate professor, Obstetrics and Gynecology, 1965 (1970)*

Hunnicutt, Benjamin K., B.A. North Carolina 1967, M.A. 1972, Ph.D. 1975; *professor, Leisure Studies, 1975 (1989)*

Hunninghake, Gary W., B.S. St. Benedict's 1968, M.D. Kansas 1972; *professor, Internal Medicine, 1981 (1984)*

Hunsicker, Lawrence G., B.A. Yale 1959, M.D. Columbia 1963; *professor, Internal Medicine, 1976 (1988)*

Hunt, Ronald J., D.D.S. Iowa 1973, M.S. 1982; *professor, Preventive and Community Dentistry, 1975 (1990)*

Huntley, John F., B.A. Chicago 1948, B.A. Michigan 1950, M.A. Connecticut 1952, Ph.D. Chicago 1961; *professor, English, 1957 (1973)*

Hurtig, Richard R., B.A. New York 1965, M.A. 1973, M.Phil. Columbia 1974, Ph.D. 1974; *associate professor, Speech Pathology and Audiology, 1976 (1982)*

Huss, Charles D., B.A. Northern Iowa 1971, M.D. Iowa 1976; *clinical assistant professor, Family Practice, 1982*

Hussey, David H., B.S. Beloit 1959, M.D. Washington (Missouri) 1964; *professor, Radiology, 1985*

Hutton, Glenda, B.A. Nebraska (Omaha) 1972, M.S.W. 1975; *adjunct instructor, School of Social Work, 1989*

Hyden, Andrew C., A.B. South Dakota 1956, M.D. Temple 1960; *clinical assistant professor, Internal Medicine, 1976*

Iannone, Liberato A., B.S. Niagara 1963, M.D. SUNY (Buffalo) 1967; *clinical assistant professor, Internal Medicine, 1980*

Imig, Charles J., A.B. Coe 1944, M.S. Iowa 1948, Ph.D. 1951; *associate professor emeritus, Physiology and Biophysics, 1951 (1987)*

Ingram, Marlynne B.F., B.S. Iowa 1981, Ph.D. Minnesota 1986; *assistant professor, Economics, 1988*

Inman, Lorinda K., B.S.N. Iowa 1971, M.S.N. Loyola (Chicago) 1976; *adjunct assistant professor, Nursing, 1989*

Ionasescu, Victor V., M.D. Bucharest (Romania) 1951, Private Docent 1957; *professor, Pediatrics, 1968 (1976)*

Irwin, W. R., B.A. Grinnell 1936, M.A. Columbia 1937, Ph.D. 1941; *professor emeritus, English, 1947 (1986)*

Isacson, Edwin P., B.S. Nebraska 1950, M.S. 1951, M.D. 1955; *professor emeritus, Preventive Medicine and Environmental Health, 1972 (1990)*

Jabbari, Gholam H., B.A. Wichita State 1971, M.D. Pahlavi (Iran) 1975; *clinical instructor, Obstetrics and Gynecology, 1982*

Jackson, Donald F., B.A. Niagara 1962, M.A. Indiana 1964, Ph.D. 1967; *associate professor, Classics, 1967 (1973)*

Jackson, Herbert L., B.A. Kansas State Teachers 1943, M.S. Wisconsin 1950, Ph.D. 1952; *professor emeritus, Radiology, 1960 (1985)*

Jackson, Nancy E., B.S. Washington 1968, M.S. 1971, Ph.D. 1975; *associate professor, Psychological and Quantitative Foundations, 1989*

Jackson, Robert A., B.A. St. Ambrose 1963, M.A. Aquinas Institute of Theology 1967, M.S.W. Iowa 1974; *assistant professor, School of Social Work, 1975*

Jacobs, H. Lee, B.A. Culver-Stockton 1926, M.A. Chicago 1930, B.D. Chicago Theological Seminary 1935, Ph.D. Iowa 1961; *associate professor emeritus, Medicine, 1957 (1970)*

Jacobs, Richard M., D.M.D. Maximillian (Germany) 1948, D.D.S. New York 1952, M.P.H. California (Berkeley) 1961, Ph.D. Medical College of Virginia 1964, M.S. Illinois 1965; *professor, Orthodontics, 1966*

Jagannathan, Raj, B.A. Madras (India) 1959, M.A. 1961, Ph.D. Carnegie-Mellon 1969; *professor, Management Sciences, 1974 (1983)*

Jain, Subhash C., B.S. Agra (India) 1957, B.E. Roorkee (India) 1960, M.E. 1966, Ph.D. Iowa 1971; *professor, Civil and Environmental Engineering, 1971 (1982)*

Jakobsen, James F., B.S. Southwest Missouri State 1950, M.A. Missouri 1952, Ph.D. 1959; *associate professor, Mathematics, 1959 (1964)*

James, Sydney V., A.B. Harvard 1950, A.M. 1951, Ph.D. 1958; *professor, History, 1965 (1967)*

Jani, Shirish K., B.Sc. Gujarat (India) 1973, M.A. Texas (Arlington) 1975, Ph.D. North Texas State 1980; *associate professor, Radiology, 1983 (1989)*

Jansa, Loren, B.A. Upper Iowa 1965, M.S.W. Illinois 1970; *adjunct instructor, School of Social Work, 1987*

January, Lewis E., B.A. Colorado College 1933, M.D. Colorado 1937, D.Sc. Colorado College 1966; *professor emeritus, Internal Medicine, 1946 (1981)*

Jarley, Paul A., B.A. Michigan 1980, M.P.P. 1982, Ph.D. Wisconsin (Madison) 1987; *assistant professor, Management and Organizations, 1986*

Jasso, Guillermina, B.A. Our Lady of the Lake 1962, M.A. Notre Dame 1970, Ph.D. Johns Hopkins 1974; *professor, Sociology, 1987*

Jebson, Peter J.R., M.B.Ch.B. St. Andrews (Scotland) 1963; *professor, Anesthesia, 1980*

Jeffers, Coleman, B.A. Berea 1949, M.A. Iowa 1951, Ph.D. 1954; *associate professor, Spanish and Portuguese, 1965*

Jenkins, Richard L., B.A. Stanford 1925, M.D. Rush 1930; *professor emeritus, Psychiatry, 1961 (1971)*

Jenni, D. Martin, B.M. DePaul 1958, A.M. Chicago 1962, D.M.A. Stanford 1966; *professor, School of Music, 1968 (1975)*

Jenny, Joanna, B.A. San Diego State 1959, M.Ed. California (Los Angeles) 1963, Ed.D. 1966; *professor emeritus, Dental Hygiene, 1976 (1989)*

Jensen, Donald P., B.A. Augustana 1966, M.D. Illinois 1970; *clinical instructor, Obstetrics and Gynecology, 1982*

Jensen, Gregory V., B.A. Simpson 1979, M.S.W. Iowa 1982; *adjunct instructor, School of Social Work, 1990*

Jensen, Kenneth G., B.S. Northern Iowa 1958, M.S. Iowa 1970, Ph.D. 1974; *adjunct assistant professor, Botany, 1982*

Jepsen, David A., B.A. Northern Iowa 1960, M.S. Wisconsin 1963, Ph.D. 1970; *professor, Counselor Education, 1970 (1982)*

Jew, Jean Y., B.S. Newcomb 1969, M.D. Tulane 1973; *associate professor, Anatomy, 1973 (1979)*

Jochimsen, Peter R., A.B. Ripon 1961, M.D. Marquette 1965; *professor, Surgery, 1974 (1983)*

Jogerst, Michael A., B.A. Western Illinois 1982, M.A. Indiana 1984, Ph.D. 1989; *assistant professor, Political Science, 1988 (1989)*

Johlin, Frederick C., B.S. Toledo 1976, M.D. Toledo Medical College 1980; *assistant professor, Internal Medicine, 1987*

Johns, Richard, B.S. Ball State 1961, M.A. 1965; *instructor, School of Journalism and Mass Communication/Curriculum and Instruction, 1968 (1973)*

Johnson, Alan K., B.S. Pennsylvania State 1964, M.A. Temple 1966, Ph.D. Pittsburgh 1970; *professor, Psychology/Pharmacology, 1973 (1982)*

Johnson, Charles A., M.D. Iowa 1955; *clinical assistant professor, Surgery, 1976*

Johnson, Dorothy, B.A. Cincinnati 1972, M.A. 1979, Ph.D. California (Berkeley) 1986; *assistant professor, School of Art and Art History, 1987*

Johnson, Eugene W., B.A. California (Riverside) 1963, M.A. 1964, Ph.D. 1966; *professor, Mathematics, 1966 (1975)*

Johnson, George F., B.A. Park 1963, Ph.D. Iowa State 1969; *professor, Pathology, 1976 (1988)*

Johnson, H. Wayne, B.S. Morningside 1953, M.A. Iowa 1954, M.A. Indiana 1956; *professor, School of Social Work, 1965 (1979)*

Johnson, Jon K., B.S. Pennsylvania State 1969, M.A. Montclair State 1976, Ph.D. Iowa 1986; *adjunct assistant professor, Civil and Environmental Engineering, 1987*

Johnson, Marion R., B.S.N. St. Teresa 1958, M.S.N. Western Reserve 1961, Ph.D. Iowa 1986; *assistant professor, Nursing, 1973*

Johnson, Norman L., B.A. Portland State 1964, M.A. Washington State 1966, Ph.D 1968; *professor, Mathematics, 1969 (1978)*

Johnson, Sandra J., B.S.Ph. North Dakota State 1970, M.S. Iowa 1987; *clinical assistant professor, Pharmacy, 1988*

Johnson, Susan R., B.A. Iowa 1973, M.D. 1976; *associate professor, Obstetrics and Gynecology, 1982 (1987)*

Johnson, Wallace W., B.S. North Dakota State 1950, D.D.S. Iowa 1957, M.S. 1958; *professor, Operative Dentistry, 1957 (1965)*

Johnson, Wayne A., B.S. Wyoming 1980, Ph.D. Washington 1985; *assistant professor, Physiology and Biophysics, 1989*

Johnson, William B., B.S. Oregon 1970, M.S. Ohio State 1973, Ph.D. 1975; *associate professor, Accounting, 1988*

Johnson, William, B.S. Marietta 1963, M.S. Miami 1965, Ph.D. Rutgers 1968; *professor, Microbiology, 1970 (1980)*

Johnston, Richard C., M.D. Iowa 1958; *clinical professor, Orthopaedic Surgery, 1967 (1982)*

Jones, David L., B.S. Westminster 1980, M.A. Iowa 1983, Ph.D. 1987; *adjunct assistant professor, Speech Pathology and Audiology, 1989*

Jones, Douglas W., B.S. Carnegie-Mellon 1973, M.S. Illinois 1976, Ph.D. 1980; *associate professor, Computer Science, 1980 (1988)*

Jones, Margaret L., R.N. Madison (Tennessee) 1961, B.S.N. Southern Missionary College 1971, M.S.N. Vanderbilt 1973; *adjunct assistant professor, Nursing, 1988*

Jones, Mark E., B.Pharm. Washington State 1973, Pharm.D. Cincinnati 1975; *adjunct associate professor, Pharmacy, 1976 (1985)*

Jones, Michael P., B.A. Southern California 1972, M.A. California (Los Angeles) 1975, Ph.D. Washington 1986; *assistant professor, Preventive Medicine and Environmental Health, 1986*

Jones, Morgan J., B.M. Iowa 1960, M.A. 1961, Ph.D. Northwestern 1975; *associate professor, School of Music, 1973 (1979)*

Jones, Phillip E., B.S. Illinois 1963, M.A. Iowa 1967, Ph.D. 1975; *adjunct assistant professor, Counselor Education, 1975*

Jones, Rhys B., B.A. Iowa 1970, D.D.S. 1973; *adjunct associate professor, Pediatric Dentistry/Preventive and Community Dentistry, 1973 (1982)*

Jones, Ronald N., B.S. Oregon 1966, M.D. 1969; *professor, Pathology, 1989*

Jordan, Herbert N., B.S. Indiana 1954, M.A. Syracuse 1957, Ph.D. 1962; *adjunct associate professor, Speech Pathology and Audiology, 1972 (1979)*

Jordan, Linda S., B.A. Iowa 1962, M.A. 1964, Ph.D. 1972; *adjunct associate professor, Speech Pathology and Audiology, 1974 (1987)*

Jordan, Richard F., B.S. Rutgers 1975, Ph.D. Princeton 1981; *associate professor, Chemistry, 1988*

Jordison, Nancy S., B.A. Iowa 1948, A.M. Chicago 1950, Ph.D. Iowa 1957; *associate professor emeritus, Nursing, 1957 (1986)*

Jorgensen, Palle E.T., A.B. Aarhus (Denmark) 1968, M.S. 1970, Ph.D. 1973; *professor, Mathematics, 1983*

Joseph, Hyman, B.S. Illinois Institute of Technology 1957, M.S. 1959, M.A. Northwestern 1966, Ph.D. 1969; *professor, Economics, 1966 (1982)*

Josephson, Nathan, B.S. Iowa 1968, M.D. 1971; *clinical associate professor, Internal Medicine, 1974 (1982)*

Judisch, G. Frank, M.D. Iowa 1962; *professor, Ophthalmology, 1975 (1985)*

Jung, Michael J., B.S. St. John's (Minnesota) 1976, M.D. South Dakota 1980; *clinical assistant professor, Family Practice, 1985*

Justin, John C., M.B.B.S. Punjab (India) 1963; *clinical assistant professor, Pediatrics, 1977*

Justman, Bruce, B.S. Loras 1979, D.D.S. Iowa 1983; *clinical instructor, Family Dentistry, 1985*

Juvenal, Michael, B.A. Missouri 1968, M.S.W. 1971; *adjunct instructor, School of Social Work, 1984*

Kaelber, William W., B.A. Cornell 1944, M.D. New York 1948; *professor, Anatomy/Neurology, 1955 (1968)*

Kahn, Gerri, B.A. Temple 1966, M.A. Iowa 1968, Ph.D. 1974; *adjunct associate professor, Speech Pathology and Audiology, 1979 (1989)*

Kalb, Esther, B.S. Denver 1956, M.A. Iowa 1977; *adjunct assistant professor, Nursing, 1987*

Kallaus, Norman F., B.S.C. Iowa 1949, M.A. 1951, Ph.D. 1956; *professor emeritus, Management and Organizations, 1953 (1988)*

Kalnitsky, George, B.A. Brooklyn 1939, Ph.D. Iowa State 1943; *professor emeritus, Biochemistry, 1946 (1988)*

Kamada, Osamu, B.A. Osaka 1974, M.A. Pittsburgh 1980, Ed.D. Massachusetts 1986; *assistant professor, Asian Languages and Literature, 1986*

Kambhu, Peter P., D.D.S. Chulalongkorn (Thailand) 1982, M.S. Iowa 1986, D.D.S. 1989; *clinical assistant professor, Preventive and Community Dentistry, 1985 (1989)*

Kammermeyer, Karl, B.S.E. Michigan 1930, B.S. 1930, M.S.E. 1931, D.Sc. 1932; *professor emeritus, Chemical and Biochemical Engineering, 1949 (1972)*

Kane, Harrison, B.C.E. City College of New York 1947, M.S. Columbia 1948, Ph.D. Illinois 1961; *professor, Civil and Environmental Engineering, 1965 (1970)*

Kanellis, Michael J., D.D.S. Iowa 1979, M.S. 1981; *adjunct assistant professor, Pediatric Dentistry, 1984*

Kao, Simon Ching-Shun, M.B.B.S. Hong Kong 1976; *assistant professor, Radiology, 1988*

Kapelanski, David P., B.Sc. Michigan 1972, M.D. Chicago 1977; *assistant professor, Surgery, 1987*

Karboski, James A., B.S.Ph. Washington State 1985, Pharm.D. Texas (Austin) 1987; *clinical assistant professor, Pharmacy, 1989*

Kardon, Randy H., B.S. Iowa 1975, Ph.D. 1982, M.D. 1982; *assistant professor, Ophthalmology, 1989*

Karniski, Lawrence P., B.S. Kansas 1974, M.D. 1977; *associate professor. Internal Medicine, 1985 (1990)*

Karr, Robert W., B.S. Southwestern (Texas) 1971, M.D. Texas (Galveston) 1975; *associate professor, Internal Medicine, 1982 (1987)*

Kasik, John E., B.S. Roosevelt 1949, M.S. Chicago 1953, M.D. 1954, Ph.D. 1962; *professor, Internal Medicine, 1970 (1973)*

Kasson, Barry G., B.A. California (San Diego) 1974, M.S. California (Los Angeles) 1977, Ph.D. 1982; *assistant professor, Pharmacology, 1986*

Kathol, Mary H., B.A. Kansas 1970, M.D. 1974; *associate professor, Radiology, 1974 (1990)*

Kathol, Roger G., B.A. Kansas 1970, M.D. 1974; *associate professor, Psychiatry/Internal Medicine, 1982 (1987)*

Kavale, Kenneth A., B.A. Brooklyn 1967, Ph.D. Minnesota 1976; *professor, Curriculum and Instruction, 1985*

Kawai, Masataka, B.A. Tokyo 1966, Ph.D. Princeton 1971; *associate professor, Anatomy, 1987*

Kazenelson, Gregorio, B.A. Reconquista (Argentina) 1952, M.D. Buenos Aires (Argentina) 1959; *clinical assistant professor, Pediatrics, 1984*

Kealey, Gerald P., B.A. Iowa 1966, M.D. 1969, M.S. 1975; *associate professor, Surgery, 1985 (1989)*

Kearney, Joseph K., B.A. Minnesota 1975, M.A. Texas (Austin) 1979, M.S. Minnesota 1981, Ph.D. 1983; *assistant professor, Computer Science, 1983*

Kearns, David L., B.S. Fort Hays State 1973, M.A. Wichita State 1979, Ph.D. Georgia State 1990; *assistant professor, Family Practice, 1990*

Kearns, John Roger, D.D.S. Iowa 1981; *adjunct assistant professor, Preventive and Community Dentistry 1981 (1984)*

Keech, Ronald V., B.A. Occidental 1970, M.D. California (San Francisco) 1974; *associate professor, Ophthalmology, 1985 (1990)*

Keimowitz, Rudolph M., B.A. Vermont 1957, M.D. 1961; *clinical instructor, Internal Medicine, 1988*

Keller, John C., M.S. Northwestern 1978, B.S. Illinois 1974, Ph.D. Northwestern 1982; *associate professor, Oral and Maxillofacial Surgery, 1988*

Kelley, Patricia L., B.A. Carleton 1956, M.S.W. Minnesota 1959, Ph.D. Iowa 1981; *associate professor, School of Social Work, 1974 (1982)*

Kelley, Robert E., B.A. Creighton 1960, Ph.D. Indiana 1968; *professor, English, 1966 (1975)*

Kelley, Verne, B.A. Colorado 1949, M.S.W. Denver 1953; *adjunct associate professor, School of Social Work, 1987 (1988)*

Kelly, Kathleen, B.S.N. Iowa 1963, M.A. 1973, Ph.D. 1987; *assistant professor, Nursing, 1975 (1983)*

Kelly, Kevin M., B.A. Iowa 1977, A.M. Illinois 1980, Ph.D. 1988; *adjunct assistant professor, Anthropology, 1988*

Kelly, Louise B., B.A. Iowa 1945, M.A. 1948; *associate professor emeritus, Rhetoric, 1963 (1989)*

Kelly, Thomas W., M.D. Iowa 1955; *clinical associate professor, Pediatrics, 1982*

Kelso, Hugh E., B.A. Iowa 1938, M.A. 1939, Ph.D. 1941; *professor emeritus, Political Science, 1946 (1984)*

Kemp, John D., B.A. Indiana 1971, M.D. 1975; *professor, Pathology/Microbiology, 1982 (1990)*

Kemp, Robert L., B.A. Iowa State Teachers 1951, M.A. Northern Iowa 1961; *assistant professor, Communication Studies, 1966 (1969)*

Kempchinsky, Paula M., B.S. East Stroudsburg State 1976, M.A. Minnesota 1980, Ph.D. California (Los Angeles) 1986; *assistant professor, Spanish and Portuguese, 1986*

Kennan, John, B.A. University College Dublin (Ireland) 1968, Ph.D. Northwestern 1973; *professor, Economics/Management and Organizations, 1980 (1987)*

Kennedy, James F., D.D.S. Iowa 1964; *adjunct associate professor, Family Dentistry, 1970 (1981)*

Kennedy, John F., B.S. Notre Dame 1955, M.S. California Institute of Technology 1956, Ph.D. 1960; *Carver/Hunter Rouse professor, Civil and Environmental Engineering, 1966*

Kenney, Sally J., B.A. Iowa 1979, B.A. Oxford 1982, M.A. Princeton 1984, Ph.D. 1989; *assistant professor, Political Science/Women's Studies, 1988 (1989)*

Kent, Thomas H., B.A. Iowa 1956, M.D. 1959; *professor, Pathology, 1966 (1972)*

Kerber, Linda K., A.B. Barnard 1960, M.A. New York 1961, Ph.D. Columbia 1968; *May Brodbeck professor, History, 1971 (1975)*

Kerber, Richard E., A.B. Columbia 1960, M.D. New York 1964; *professor, Internal Medicine, 1971 (1978)*

Kern, Alexander C., B.A. Yale 1930, M.A. Wisconsin 1933, Ph.D. 1936; *professor emeritus, English/American Studies, 1936 (1975)*

Kern, Jeffrey A., B.S. Wisconsin 1975, M.D. 1979; *assistant professor, Internal Medicine, 1988*

Kerr, Barbara A., A.B. Missouri 1973, M.A. Ohio State 1975, Ph.D. Missouri 1978; *associate professor, Counselor Education, 1985 (1987)*

Kerr, Wendle L., B.S. Iowa 1941, M.S. 1950; *associate professor emeritus, Pharmacy, 1947 (1988)*

Kessel, Richard G., B.S. Parsons 1953, M.S. Iowa 1956, Ph.D. 1959; *professor, Biology, 1961 (1968)*

Ketterer, Robert C., B.A. Lawrence 1974, M.A. Michigan 1976, Ph.D. 1981; *assistant professor, Classics, 1988*

Keyes, Margaret N., B.A. Cornell 1939, M.S. Wisconsin 1951, Ph.D. Florida State 1965, L.H.D. Cornell 1976, D.H. Coe 1977; *professor emeritus, Home Economics, 1951 (1988)*

Khera, Satish C., B.D.S. Lucknow (India) 1968, M.S. Iowa 1970, D.D.S. 1974; *professor, Operative Dentistry, 1972 (1988)*

Khurana, Surjit S., B.A. Punjab (India) 1953, M.A. 1955, Ph.D. Illinois 1968; *professor, Mathematics, 1968 (1979)*

Kienzle, George C., D.D.S. Iowa 1958; *adjunct associate professor, Oral Pathology and Diagnosis, 1966 (1982)*

Kienzle, Michael G., B.S. Iowa 1973, M.D. 1977; *associate professor, Internal Medicine, 1984 (1990)*

Killip, Devore E., B.S. Illinois 1944, D.D.S. 1947, M.S. 1963; *professor emeritus, Operative Dentistry/Psychological and Quantitative Foundations, 1966 (1989)*

Kilpatrick, Franklin, B.Ch.E. Minnesota 1941, M.P.H. 1943; *associate professor emeritus, Preventive Medicine and Environmental Health/Civil and Environmental Engineering, 1961 (1981)*

Kim, Chong Lim, B.A. Seoul (Korea) 1960, M.A. Oregon 1965, Ph.D. 1968; *professor, Political Science, 1967 (1976)*

Kim, Jae-On, B.A. Seoul (Korea) 1961, M.S. Southern Illinois 1964, Ph.D. California (Berkeley) 1976; *professor, Sociology, 1970 (1981)*

Kim, Sang Sup, B.S. Seoul National (Korea) 1973, M.S. 1975, Ph.D. Iowa 1985; *assistant professor, Mechanical Engineering, 1988*

Kim, Sung-Soo, B.S. Seoul National (Korea) 1981, M.S. Iowa 1983, Ph.D. 1988; *adjunct assistant professor, Mechanical Engineering, 1989*

Kimura, Alan E., B.S. Michigan 1978, M.D. Chicago Medical 1982; *assistant professor, Ophthalmology, 1989*

Kimura, Jun, B.T. Kyoto (Japan) 1957, M.D. 1961; *professor, Neurology, 1972 (1977)*

Kimura, Ken M.D. Kobe (Japan) 1963, Ph.D. 1976; *associate professor, Surgery, 1987*

Kinser, Daniel D., D.D.S. Iowa 1960, M.S. 1970; *adjunct associate professor, Orthodontics, 1978 (1988)*

Kioschos, John M., B.S. Gymnasium (Germany) 1953, M.D. Heidelberg (Germany) 1959; *associate professor, Internal Medicine, 1966 (1972)*

Kiraly, John, Jr., B.S. Springfield 1954, M.Div. Southeastern Baptist Theological Seminary 1960, M.A. Nevada 1966, Ph.D. Minnesota 1970; *associate professor emeritus, Curriculum and Instruction, 1970 (1989)*

Kirchhoff, Louis V., A.B. Harvard 1966, B.A. California (San Diego) 1972, M.D. Yale 1977, M.P.H. 1977; *associate professor, Internal Medicine, 1985 (1990)*

Kirchner, Peter T., B.A. Yale 1960, M.D. Columbia 1964; *professor, Radiology/Internal Medicine, 1981 (1983)*

Kirk, William A., A.B. DePauw 1958, M.A. Missouri 1960, Ph.D. 1962; *professor, Mathematics, 1967 (1970)*

Kirschling, M. Virginia, B.S.N. Loyola 1971; *adjunct instructor, Nursing, 1987*

Kisker, C. Thomas, B.A. Johns Hopkins 1958, M.D. Cincinnati 1962; *professor, Pediatrics, 1973 (1979)*

Kittrell, Tracy M., D.D.S. Iowa 1985; *adjunct instructor, Family Dentistry, 1986*

Klapper, Gilbert, B.S. Stanford 1956, M.S. Kansas 1958, Ph.D. Iowa 1962; *professor, Geology, 1968 (1973)*

Klasson, Charles R., B.S. Ohio State 1953, M.B.A. 1956, D.B.A. Indiana 1960; *professor, Management and Organizations, 1967*

Klaus, Carl H., B.A. Michigan 1953, M.A. 1954, Ph.D. Cornell 1966; *professor, English, 1962 (1973)*

Kleiber, Charmaine M., B.S.N. Kansas 1973, M.S. Colorado 1979; *adjunct instructor, Nursing, 1986*

Kleiber, Paul D., B.A. Occidental 1976, Ph.D. Colorado 1981; *associate professor, Physics and Astronomy, 1985 (1988)*

Kleiman-Wexler, Rachel L., B.Pharm. Hebrew (Israel) 1975, M.S. 1978, Pharm.D. Utah 1983; *assistant professor, Pharmacy, 1985 (1986)*

Klein, Philip W., B.A. Grinnell 1962, M.A. Washington 1968, Ph.D. 1974; *associate professor, Spanish and Portuguese, 1977 (1984)*

Kleinfeld, Erwin, B.S. City College of New York 1948, M.A. Pennsylvania 1949, Ph.D. Wisconsin 1951; *professor, Mathematics, 1968*

Kleinfeld, Margaret, A.B. Rochester 1960, M.S. Syracuse 1963, Ph.D. 1965; *associate professor, Mathematics, 1968 (1976)*

Klemm, David E., B.A. Marlboro 1972, Ph.D. Iowa 1980; *associate professor, School of Religion, 1982 (1987)*

Kline, Gregory L., D.D.S. Iowa 1985; *adjunct assistant professor, Preventive and Community Dentistry, 1986*

Klingler, George S., B.A. Bucknell 1962, M.T. Illinois 1966, Ph.D. Iowa 1974; *associate professor, Communication Studies, 1974 (1982)*

Klink, William H., B.A. Michigan 1959, Ph.D. Johns Hopkins 1964; *professor, Physics and Astronomy/Statistics, 1965 (1976)*

Klotz, Donald D., B.S. Iowa State Teachers 1934, M.A. Iowa 1941, Ph.D. 1948; *associate professor emeritus, Exercise Science, 1946 (1971)*

Knapp, L. W., Jr., B.S. Cornell 1951, M.S. 1955; *professor emeritus, Preventive Medicine and Environmental Health, 1959 (1988)*

Knarr, Warren A., B.S. Kansas 1952, Ph.D. 1960, B.S.Ph Iowa 1976; *adjunct instructor, Pharmacy, 1988*

Knight, W. H., Jr., B.A. North Carolina 1976, J.D. Columbia 1979; *professor, Law, 1983 (1988)*

Knorr, Georg, Diplom Institute of Technology Munich (Germany) 1954, Ph.D. Munich (Germany) 1963; *professor, Physics and Astronomy, 1967 (1974)*

Knott, John R., B.A. Iowa 1935, M.A. 1936, Ph.D. 1938; *professor emeritus, Psychiatry/Neurology, 1941 (1976)*

Knudson, Ralph H., B.A. Luther 1968, M.D. Iowa 1972; *assistant professor, Family Practice, 1985 (1989)*

Knutson, John, A.B. Augustana 1964, M.S. Washington State 1967, Ph.D. 1969; *professor, Psychology, 1969 (1981)*

Koch, Donald L., B.S. Iowa 1959, M.S. 1967; *adjunct professor, Geology, 1980*

Koehn, Darcy L., B.S.N. Coe 1973, M.A. Iowa 1987; *adjunct instructor, Nursing, 1988*

Koellner, Paul G., B.A. St. Ambrose 1955, M.D. St. Louis 1960; *clinical assistant professor, Pediatrics, 1979*

Koerner, Theodore A., B.S. Louisiana State 1970, Ph.D. 1975, M.D. Tulane 1978; *associate professor, Pathology, 1986 (1988)*

Kohout, Frank J., B.S. John Carroll 1963, M.A. Case-Western Reserve 1965, Ph.D. 1970; *professor, Periodontics, 1969 (1988)*

Kolder, Hansjoerg E., M.D. Vienna (Austria) 1950, Ph.D. 1959; *professor, Ophthalmology, 1968 (1973)*

Kolen, Michael J., B.S. Iowa 1973, M.A. Arizona 1975, Ph.D. Iowa 1979; *adjunct assistant professor, Psychological and Quantitative Foundations, 1984 (1989)*

Kollmorgen, Robert L., B.S. Iowa State 1959, M.D. Nebraska 1962; *clinical assistant professor, Surgery, 1986*

Kollros, Jerry J., B.S. Chicago 1938, Ph.D. 1942; *professor emeritus, Biology, 1946 (1988)*

Konkel, Doris, B.S. Iowa State 1974, M.S.W. Iowa 1977; *adjunct instructor, School of Social Work, 1981*

Koontz, Franklin P., B.S. Maryland 1958, M.S. 1960, Ph.D. 1962; *professor, Pathology, 1964 (1980)*

Koorbusch, Gerard F., B.S. Georgetown 1969, D.D.S. 1973, M.B.A. Connecticut 1987; *assistant professor, Oral and Maxillofacial Surgery, 1988*

Kopp, Ulla C., B.Sc. Uppsala (Sweden) 1970, Ph.D. Gothenburg (Sweden) 1980; *adjunct assistant professor, Internal Medicine, 1988*

Korpel, Adrianus, B.S. Delft (Netherlands) 1953, M.S. 1955, Ph.D. 1969; *professor, Electrical and Computer Engineering, 1977*

Kortanek, Kenneth O., B.S.B.A. Northwestern 1958, M.S. 1959, Ph.D. 1964; *John F. Murray professor, Management Sciences, 1986*

Kosier, Frank J., B.S. Michigan State 1956, M.S. 1957, Ph.D. 1960, *professor, Mathematics, 1965 (1970)*

Kottick, Edward L., A.B. New York 1953, M.A. Tulane 1959, Ph.D. North Carolina 1962; *professor, School of Music, 1968 (1976)*

Kottman, E. John, B.A. Iowa 1949, M.A. 1956, Ph.D. 1963; *associate professor emeritus, Marketing, 1956 (1987)*

Koupal, Robert, B.A. Iowa 1977, M.S.W. 1985; *adjunct instructor, School of Social Work, 1989*

Koutsoudas, Andreas, B.A. Michigan 1954, M.A. 1958, Ph.D. 1961; *professor, Linguistics, 1976*

Krachmer, Jay H., B.S. Tulane 1962, M.D. 1966; *professor, Ophthalmology, 1974 (1981)*

Kracht, Arthur N., D.D.S. Northwestern 1933, M.S. Iowa 1961; *assistant professor emeritus, Prosthodontics, 1961 (1975)*

Krajewski, Witold F., M.S. Technical University of Warsaw (Poland) 1976, Ph.D. 1980; *assistant professor, Civil and Environmental Engineering, 1987*

Kral, Dennis, B.S. Iowa Wesleyan 1961, D.D.S. Iowa 1965; *adjunct assistant professor, Preventive and Community Dentistry, 1985*

Krause, Vicki L., B.S.N. Wisconsin 1969, M.S. 1974; *adjunct instructor, Nursing 1981 (1983)*

Krause, Walter, B.A. Oregon 1942, M.A. 1943, A.M. Harvard 1944, Ph.D. 1945; *John F. Murray professor emeritus, Finance, 1958 (1987)*

Krell, Keith V., B.A. Washington 1970, M.A. U.S. International 1975, D.D.S. Iowa 1981, M.S. 1983; *adjunct associate professor, Endodontics, 1983 (1989)*

Krem, George D., B.M. Wheaton 1963, M.M. American Conservatory of Music 1970; *associate professor, School of Music, 1982 (1987)*

Kremenak, Charles R., D.D.S. Iowa 1955, M.S. 1961; *professor, Orthodontics/Otolaryngology-Head and Neck Surgery, 1959 (1973)*

Kremenak, Nellie W., *adjunct assistant professor, Endodontics, 1985*

Kresowik, Timothy F., B.S. Michigan 1976, M.D. 1980, M.S. 1984; *assistant professor, Surgery, 1988*

Kress, Kenneth J., B.A. California (Los Angeles) 1978, M.A. California (Berkeley) 1983, J.D. 1985; *professor, Law, 1985 (1989)*

Kretzschmar, Robert M., B.A. Michigan 1952, M.D. 1957; *clinical professor, Obstetrics and Gynecology, 1962 (1984)*

Kreyd, Vadim, M.A. Leningrad (USSR) 1960, Ph.D. Michigan 1983; *associate professor, Russian, 1985 (1988)*

Kross, Burton C., B.S. Iowa 1969, M.S. Colorado 1971, Ph.D. Iowa 1987; *assistant professor, Preventive Medicine and Environmental Health/ Civil and Environmental Engineering, 1987*

Krupa, Gene H., B.A. Stanford 1965, M.A. Columbia 1966, Ph.D. Iowa 1975; *associate professor, Rhetoric, 1978 (1981)*

Kruse, Katherine A., B.A. Iowa 1945, M.S.W. Washington (Missouri) 1953; *associate professor emeritus, School of Social Work 1956 (1988)*

Kruse, Louise G., B.S.N. Mankato State 1961, M.A. Iowa 1972; *assistant professor, Nursing, 1972 (1975)*

Kubik, Rudy R., B.A. Northern Iowa 1960, D.D.S. Iowa 1975; *adjunct assistant professor, Preventive and Community Dentistry, 1977*

Kudsk, Elizabeth G., B.A. Massachusetts 1965, M.S.W. Iowa 1979; *adjunct instructor, School of Social Work, 1984*

Kuenzli, Rudolf E., Licence Zurich (Switzerland) 1964, M.A. Wisconsin 1968, M.A. 1969, Ph.D. 1971; *professor, English/Comparative Literature, 1970 (1982)*

Kuhl, Jon G., B.S. Iowa 1975, M.S. 1977, Ph.D. 1980; *associate professor, Electrical and Computer Engineering, 1980 (1986)*

Kuhn, Jerry N., B.S.Ed. Central Missouri 1948, M.S.Ed. 1951, Ph.D. Iowa 1954; *professor emeritus, Curriculum and Instruction/Planning, Policy and Leadership Studies, 1954 (1990)*

Kuk, Francis K., B.S. Miami 1980, M.A. Iowa 1983, Ph.D. 1986; *adjunct assistant professor, Speech Pathology and Audiology, 1989*

Kukulka, Carl G., B.S. Ithaca 1971, Ph.D. Medical College of Virginia 1978; *associate professor, Physical Therapy, 1982 (1988)*

Kuljis, Rodrigo O., B.S. Craighouse (Chile) 1972, M.D. Chile 1978; *assistant professor, Neurology, 1989*

Kultas-Ilinsky, H. K., Ph.D. Academy of Medical Science (USSR) 1965; *professor, Anatomy, 1982 (1989)*

Kumar, Samuel P., M.B.B.S. Osmania Medical (India) 1968; *clinical assistant professor, Internal Medicine, 1978*

Kumar, Viney, B.Sc. D.A.V. (India) 1970, M.B.B.S. Government Medical (India) 1976; *assistant professor, Anesthesia, 1986*

Kung, Chen-ho, B.S. Peking 1977, M.Sc. Trondheim 1980, Ph.D. 1984; *assistant professor, Computer Science, 1987*

Kuntz, J. Kenneth, B.A. Grinnell 1956, B.D. Yale 1959, Ph.D. Union Theological Seminary 1963; *professor, School of Religion, 1967 (1976)*

Kuperman, Samuel, B.A. Iowa 1975, M.D. 1978; *associate professor, Psychiatry, 1983 (1989)*

Kupersmith, William R., A.B. Georgetown 1963, Ph.D. Texas 1969; *professor, English, 1972 (1981)*

Kurth, Walter J., B.A. Concordia Seminary 1967, M.Div. 1971, M.S.W. Iowa 1976; *adjunct instructor, Social Work, 1986*

Kurtz, Sheldon F., A.B. Syracuse 1964, LL.B. 1967; *Percy Bordwell professor, Law, 1973 (1976)*

Kus, Robert J., B.A. Cleveland State 1968, Ph.D. Montana 1981, M.S. Oklahoma 1982; *associate professor, Nursing, 1982 (1988)*

Kuslak, Andrew, B.Sc. Warsaw Technical 1972, M.Sc. 1974, Ph.D. Polish Academy of Science 1979; *professor, Industrial and Management Engineering, 1988*

Kutzko, Philip C., B.A. City College of New York 1967, M.S. Wisconsin 1968, Ph.D. 1972; *professor, Mathematics, 1974 (1979)*

Kvidera, Allen P., D.D.S. Iowa 1976, Ph.D. 1980; *adjunct assistant professor, Periodontics, 1986*

LaBrecque, Douglas R., B.S. Boston College 1965, M.D. Stanford 1970; *professor, Internal Medicine, 1977 (1988)*

LaFosse, Leopold, *professor, School of Music, 1972 (1980)*

Lagorio, Valerie M., B.A. Lone Mountain 1963, M.A. Stanford 1964, Ph.D. 1966; *professor, English, 1972 (1975)*

Lainson, Phillip A., B.A. Iowa 1960, D.D.S. 1962, M.S. 1968; *professor, Periodontics, 1965 (1975)*

Lakes, Roderic S., B.S. Rensselaer Polytechnic Institute 1969, Ph.D. 1975; *professor, Biomedical Engineering/Mechanical Engineering, 1978 (1986)*

Lakin, Jean A., B.S.N. Michigan 1959, M.S. 1967, Ph.D. Iowa 1982; *associate professor, Nursing, 1967 (1988)*

LaMarte, Frank P., B.S. Mercy (New York) 1972, M.S. Fordham 1974, M.S. New York 1977, M.D. Creighton 1981, M.S. Iowa 1987; *clinical assistant professor, Preventive Medicine and Environmental Health, 1988*

Lambakis, Kathleen, B.A. St. Louis 1969, M.S.W. Iowa 1971; *adjunct assistant professor, School of Social Work, 1988*

Lambakis, Paul H., B.A. Drake, M.S.W. Iowa; *adjunct assistant professor, Social Work, 1986 (1990)*

Lamping, Kathryn G., B.S. Illinois (Urbana) 1976, M.S. Milwaukee Medical 1982, Ph.D. 1983; *adjunct assistant professor, Internal Medicine, 1989*

Lampkin, Richard M., B.S. St. Norbert 1976, M.A. Troy State 1985; *assistant professor, Military Science, 1989*

Lance, George M., B.S.M.E. Case Institute of Technology 1952, M.S. 1954; *professor, Mechanical Engineering, 1961 (1970)*

Landas, Steve K., B.A. Luther 1978, M.D. Iowa 1983; *assistant professor, Pathology, 1988*

Landini, Gregory, A.B. Indiana 1978, M.A. 1981, Ph.D. 1986; *assistant professor, Philosophy, 1989*

Landon, R. Brooks, B.A. Centre 1970, M.A. Texas (Austin) 1973, Ph.D. 1978; *associate professor, English, 1978 (1984)*

Landsman, Miriam J., B.A. Delaware 1976, M.S.W. Iowa 1982; *adjunct assistant professor, School of Social Work, 1988*

Landweber, Louis, B.S. City College of New York 1932, M.A. George Washington 1936, Ph.D. Maryland 1951; *professor emeritus, Mechanical Engineering, 1954 (1982)*

Langwith, Dennis K., D.D.S. Iowa 1976, M.S. 1980; *adjunct instructor, Preventive and Community Dentistry, 1983*

Lansing, Charissa R., B.S. Illinois 1971, M.A. 1972, Ph.D. Iowa 1984; *adjunct assistant professor, Speech Pathology and Audiology, 1989*

Lansing, Paul, B.A. Queens (New York) 1968, J.D. Illinois 1971, Diploma Stockholm 1973; *associate professor, Management and Organizations, 1979 (1982)*

Lara-Braud, Carolyn W., B.A. Texas 1962, Ph.D. 1969; *associate professor, Home Economics, 1975 (1980)*

Larew, Mary S., B.A. Iowa 1974, M.D. 1978; *clinical assistant professor, Pediatrics, 1985*

Laronde, Michel S., Lic.-es-Let. Clermont-Ferrand (France) 1971, Mait.-es-Let. 1972, M.A. Indiana 1976, Ph.D. 1981; *assistant professor, French and Italian, 1982 (1985)*

Larsen, Karl, B.A. St. Olaf 1956, M.D. Northwestern 1960; *clinical associate professor, Internal Medicine, 1974 (1983)*

Larson, Erling, M.D. Iowa 1948; *clinical associate professor, Internal Medicine, 1976*

Larson, Ronald C., B.A. Northern Iowa 1969, M.S.W. Iowa 1974; *adjunct instructor, School of Social Work, 1979*

Larson, Walter W., M.D. Iowa 1953; *clinical assistant professor, Pediatrics, 1979*

Lasansky, Mauricio, D.F.A. Iowa Wesleyan 1959; *Hancher professor emeritus, School of Art and Art History, 1945 (1984)*

Lata, Gene F., B.S. City College of New York 1942, M.S. Illinois 1948, Ph.D. 1950; *associate professor, Biochemistry, 1950 (1963)*

Latourette, Howard B., A.B. Oberlin 1940, M.D. Michigan 1943; *professor emeritus, Radiology, 1959 (1983)*

Laube, Douglas W., B.A. Macalester 1966, M.D. Iowa 1970; *professor, Obstetrics and Gynecology, 1976 (1987)*

Laube, Janet, B.A. Macalaster College 1966, M.S.W. Iowa 1969; *adjunct associate professor, School of Social Work, 1980 (1988)*

Lauer, Ronald M., B.Sc. Manitoba (Canada) 1954, M.D. 1954; *professor, Pediatrics/Preventive Medicine and Environmental Health, 1968*

Laughlin, Philip R., A.B. Creighton 1962, M.A. Portland 1965, Ph.D. 1968; *adjunct assistant professor, Psychological and Quantitative Foundations, 1978*

Laures, E. JoAnn, B.A. Marygrove 1955, M.S.W. Wayne State 1963; *adjunct instructor, School of Social Work, 1984*

Lauria, Mickey, A.B. California (Los Angeles) 1975, M.A. Minnesota 1977, Ph.D. 1980; *adjunct associate professor, Geography, 1981 (1986)*

LaVelle, William E., B.A. Iowa 1962, D.D.S. 1962, M.S. 1967; *professor, Otolaryngology-Head and Neck Surgery/Prosthodontics, 1964 (1977)*

Lawler, Edward J., B.A. California State (Long Beach) 1966, M.A. California State (Los Angeles) 1968, Ph.D. Wisconsin 1972; *professor, Sociology, 1971 (1982)*

Lawrence, Susan C., B.A. Pomona 1977, M.S. Toronto (Canada) 1980, Ph.D. 1985; *assistant professor, History, 1989*

Lawton, Richard L., B.A. Omaha 1939, B.S. Nebraska 1943, M.D. 1943; *clinical professor, Surgery, 1953 (1983)*

Lawton, William J., B.A. Northwestern 1963, M.D. 1966; *associate professor, Internal Medicine, 1973 (1982)*

Laycock, Deborah M., B.A. Alberta 1977, M.A. British Columbia 1979, Ph.D. Stanford 1987; *assistant professor, English, 1986 (1987)*

Leary, James M., B.S. Parsons 1963, D.D.S. Iowa 1968, M.S. 1984; *associate professor, Family Dentistry, 1985 (1989)*

Lechay, James, B.A. Illinois 1928, D.F.A. Coe 1961; *professor emeritus, School of Art and Art History, 1947 (1975)*

Lediaev, John P., B.A. Occidental 1963, M.A. California (Riverside) 1965, Ph.D. 1967; *associate professor, Mathematics, 1967 (1971)*

Ledolter, Johannes, M.R.S.O. Vienna (Austria) 1974, M.S. Wisconsin 1972, Ph.D. 1975; *professor, Statistics and Actuarial Science/ Management Sciences, 1978 (1987)*

Lee, Hon-Chi, B.S. Massachusetts Institute 1973, M.D. Harvard Medical 1981, Ph.D. Harvard 1981; *assistant professor, Internal Medicine, 1988*

Leggett, John W., A.B. Yale 1942; *professor emeritus, English, 1970 (1987)*

Leininger, Joel R., D.V.M. Iowa State 1972, Ph.D. Georgia 1976; *adjunct assistant professor, Preventive Medicine and Environmental Health, 1978 (1980)*

Lembke, Valdean C., B.S. Iowa State 1962, M.B.A. Michigan 1965, Ph.D. 1969; *professor, Accounting, 1968 (1982)*

Lemke, Jon H., B.A. Yankton 1970, M.A. South Dakota 1972, Ph.D. Pennsylvania 1983; *associate professor, Preventive Medicine and Environmental Health, 1980 (1986)*

Lemmer, John H., B.S. Oregon 1974, M.D. 1979; *assistant professor, Surgery, 1987*

Lemon, David K., B.S. Iowa 1968, M.D. 1972; *clinical assistant professor, Internal Medicine, 1977*

Lensink, Stephen C., B.S. Iowa State 1968, M.A. Iowa 1976, Ph.D. 1984; *adjunct assistant professor, Anthropology, 1988*

Lenth, Russell V., B.S. New Mexico 1970, M.A. 1972, Ph.D. 1975; *associate professor, Statistics and Actuarial Science, 1975 (1981)*

Lentzkow, Susan, M.S.W. Iowa 1981; *adjunct instructor, School of Social Work, 1987*

LePeau, Nancy Sisty, B.A. Michigan 1965, M.S. Columbia 1966, M.A. Indiana 1971; *associate professor, Dental Hygiene, 1971 (1975)*

Le Poidevin, Jean S., B.S. Wisconsin 1942, M.D. 1945; *clinical assistant professor, Pediatrics, 1979*

Leach, Jean H., D.D.S. Iowa 1988; *adjunct instructor, Operative Dentistry, 1989*

Leslie, David K., B.A. San Jose State 1954, M.A. 1961, Ph.D. Iowa 1970; *associate professor, Exercise Science/Curriculum and Instruction, 1969 (1975)*

Leutner, Robert W., B.A. Harvard 1968, M.A. Michigan 1970, M.A. 1973, Ph.D. 1976; *associate professor, Asian Languages and Literature, 1982 (1985)*

Leverington, John, B.A. Iowa 1974, M.S.W. 1978; *adjunct instructor, School of Social Work, 1988*

Levett, James M., B.A. Carleton 1970, M.D. Iowa 1974; *clinical associate professor, Surgery, 1988*

Levey, Linda M., A.B. Douglass 1962, M.A. Tufts 1968, M.Phil. City University of New York 1976, Ph.D. 1981; *adjunct assistant professor, Nursing, 1983*

Levey, Samuel, A.B. Bowdoin 1955, A.M. Columbia 1956, M.A. Iowa 1959, Ph.D. 1961, S.M. Harvard 1963; *Gerhard Hartman professor, Hospital and Health Administration, 1960 (1977)*

Levin, Irwin P., B.A. California (Los Angeles) 1960, M.A. 1963, Ph.D. 1965; *professor, Psychology, 1965 (1977)*

Levitz, Gary S., B.A. New York (Albany) 1969, M.A. 1971, Ph.D. Michigan 1979; *adjunct associate professor, Hospital and Health Administration, 1978 (1986)*

LeVois, Camille, B.A. Southwestern Louisiana 1932, M.A. Louisiana State 1934, Certificat de Phonetique Paris (France) 1939, Ph.D. Iowa 1942; *professor emeritus, French and Italian/Curriculum and Instruction, 1945 (1972)*

Levy, Steven M., A.B. Princeton 1978, D.D.S. North Carolina 1982, M.P.H. 1984; *associate professor, Preventive and Community Dentistry, 1984 (1989)*

Lewis, Thomas E., A.B. Brown 1973, C.Phil. California (San Diego) 1976, Ph.D. 1978; *associate professor, Spanish and Portuguese/Comparative Literature, 1978 (1984)*

Lewis-Beck, Michael S., B.S. Ball State 1965, M.A. Michigan 1966, Ph.D. 1973; *professor, Political Science, 1974 (1982)*

Lickteig, David J., B.S. Iowa 1981, D.D.S. 1986; *adjunct assistant professor, Preventive and Community Dentistry, 1988*

Liittschwager, John M., B.S. Iowa State 1955, M.S. Northwestern 1961; *professor, Industrial and Management Engineering, 1961 (1968)*

Lilly, Gilbert, B.S. Minnesota 1951, D.D.S. 1955; *professor, Oral Pathology and Diagnosis, 1975*

Lim, Ramon, M.D. Santo Tomas (Philippines) 1958, Ph.D. Pennsylvania 1966; *professor, Neurology, 1981 (1984)*

Lim, Victoria S., A.A. Far Eastern (Philippines) 1956, M.D. 1960; *associate professor, Internal Medicine, 1982*

Lin, Bor-Luh, B.S. National Taiwan 1956, M.S. Notre Dame 1960, Ph.D. Northwestern 1963; *professor, Mathematics, 1963 (1972)*

Lin, Jim Jung-Ching, B.S. National Taiwan 1969, Ph.D. Connecticut 1979; *associate professor, Biology, 1984 (1987)*

Lind, Daniel G., *adjunct assistant professor, School of Journalism and Mass Communication, 1985*

Lindberg, James B., B.A. Denison 1950, M.B.A. Michigan 1952, Ph.D. Wisconsin 1963; *professor, Geography, 1960 (1975)*

Lindgren, Scott D., B.A. Yale 1972, M.A. Iowa 1975, Ph.D. 1977; *associate professor, Pediatrics, 1980 (1986)*

Lindquist, Mary, B.A. California State 1977, M.S. 1978; *adjunct assistant professor, Nursing, 1983*

Lindsay, James M., A.B. Michigan 1981, M.A. Yale 1983, Ph.D. 1988; *assistant professor, Political Science, 1987 (1988)*

Linhardt, Robert J., B.S. Marquette 1975, M.A. John S. Hopkins 1977, Ph.D. 1979; *professor, Pharmacy, 1982 (1990)*

Linsmeier, Thomas J., B.B.A. Wisconsin (Madison) 1978, M.B.A. 1980; *instructor, Accounting, 1984*

Little, David L., B.S.M. Nebraska 1970, M.D. 1970; *clinical assistant professor, Pediatrics, 1980*

Liu, Y. King, B.S. Bradley 1955, M.S. Wisconsin 1959, Ph.D. Wayne State 1963; *professor, Biomedical Engineering/Mechanical Engineering/Orthopaedic Surgery, 1978*

Lively, Sonja I., B.S.N. Iowa 1969, M.A. 1970; *assistant professor, Nursing, 1976*

Livingston, Debra J., B.S.N. Michigan 1970, M.S. 1975; *adjunct instructor, Nursing, 1985*

Lloyd-Jones, Richard, B.A. New Mexico 1949, M.A. North Carolina 1950, Ph.D. Iowa 1956; *professor, English, 1952 (1965)*

Lockhart, Barbara, B.S. Michigan State 1964, M.A. 1967, Ph.D. Brigham Young 1971; *professor, Physical Education and Sports Studies, 1986*

Lockhart, Jack M., B.A. Dartmouth 1967, B.M.S. 1968, M.D. Harvard 1970; *clinical instructor, Internal Medicine, 1988*

Loening, Stefan, M.D. Medical School Freiburg (Germany) 1965; *professor, Urology, 1975 (1982)*

Loening-Baucke, Vera, Abitur Oberrealschule of Kronach (Germany) 1961, M.D. Medical School of Erlangen (Germany) 1967; *associate professor, Pediatrics, 1975 (1985)*

Loewenberg, Gerhard, A.B. Cornell 1949, A.M. 1950, Ph.D. 1955; *professor, Political Science, 1969 (1970)*

Loftus, Christopher M., A.B. Dartmouth 1975, M.D. S.U.N.Y. (Downstate Medical Center) 1979; *associate professor, Surgery, 1985 (1989)*

Logan, Henrietta L., B.A. Wichita 1961, M.A. Iowa 1973, Ph.D. 1976; *associate professor, Preventive and Community Dentistry/ Psychological and Quantitative Foundations, 1975 (1980)*

Logan, Nelson S., B.S. Wichita State 1961, M.S. Utah 1965, Ph.D. 1969; *professor, Preventive and Community Dentistry, 1970 (1978)*

Lohafer, Susan, A.B. Radcliffe 1964, M.A. Stanford 1966, Ph.D. New York 1970; *professor, English, 1973 (1982)*

Lohman, David F., B.A. Notre Dame 1972, Ph.D. Stanford 1979; *associate professor, Psychological and Quantitative Foundations, 1981 (1986)*

Lombard, Kenneth A., B.A. Loma Linda 1978, M.D. 1982; *assistant professor, Pediatrics, 1989*

Long, John Paul, B.S. Iowa 1950, M.S. 1952, Ph.D. 1954; *Carver professor, Pharmacology, 1953 (1963)*

Long, Keith R., B.A. Kansas 1951, M.A. 1953, Ph.D Iowa 1960; *professor emeritus, Preventive Medicine and Environmental Health/Civil and Environmental Engineering, 1960 (1986)*

Longo, Frank J., B.S. Loyola 1962, M.S. Oregon State 1965, Ph.D. 1967; *professor, Anatomy, 1976 (1979)*

Lonngren, Karl E., B.S. Wisconsin 1960, M.S. 1962, Ph.D. 1964; *professor, Electrical and Computer Engineering/Physics and Astronomy, 1965 (1972)*

Loomer, Bradley M., B.A. Iowa 1953, M.A. 1956, Ph.D. 1962; *professor, Planning, Policy and Leadership Studies, 1964 (1970)*

Loos, Gerald D., B.A. South Dakota 1966, B.S. 1966, M.D. Iowa 1968; *clinical associate professor, Family Practice, 1987*

Lorson, Edward L., D.D.S. Northwestern 1969, M.S. Iowa 1972; *adjunct associate professor, Oral and Maxillofacial Surgery, 1972 (1989)*

Lowe, Timothy J., B.S.I.E. Iowa State 1965, M.E. 1967, Ph.D. Northwestern 1973; *C. Maxwell Stanley professor of Operations Management, Management Sciences, 1989*

Lowe, William L., B.A. North Carolina 1976, M.D. 1980; *assistant professor, Internal Medicine, 1988*

Lu, Charles C., M.D. National Taiwan University 1956; *associate professor, Radiology, 1974 (1984)*

Lubaroff, David M., B.S. Philadelphia College of Pharmacy and Science 1961, M.S. Georgetown 1964, Ph.D. Yale 1967; *professor, Urology/Microbiology, 1973 (1982)*

Ludke, Robert L., B.S. Wisconsin 1968, M.S. 1971, Ph.D. 1980; *associate professor, Hospital and Health Administration, 1977 (1984)*

Ludvigson, Gregory A., B.S. Iowa 1972, M.S. 1976, Ph.D. 1988; *adjunct assistant professor, Geology, 1988*

Luebke, Robert J., D.D.S. Iowa 1970, M.S. 1976; *clinical associate professor, Prosthodontics, 1976 (1986)*

Luerkens, David W., B.S. Iowa 1975, M.S. 1978, Ph.D. 1980; *assistant professor, Chemical and Biochemical Engineering, 1984*

Lund, Donald D., B.S. Michigan State 1967, M.A. 1968, Ph.D. Iowa 1975; *adjunct assistant professor, Internal Medicine, 1989*

Lund, Peter S., B.F.A. Minnesota 1976, D.D.S. 1980, M.S. 1987; *assistant professor, Prosthodontics, 1987*

Luper, Albert T., B.Mus. Texas Christian 1934, M.M. Rochester 1938, Certificate Conservatorio Nacional de Musica (Portugal) 1939, Liceu Pedro Nuñes (Portugal) 1939; *professor emeritus, School of Music, 1948 (1982)*

Luschel, Erich S., B.S. Washington 1964, Ph.D. 1968; *professor, Speech Pathology and Audiology, 1983*

Lutgendorf, Philip A., B.A. Chicago 1971, M.A. 1982, Ph.D. 1986; *assistant professor, Asian Languages and Literature, 1985 (1986)*

Lutz, Charles T., B.S. Chicago 1975, Ph.D. 1981, M.D. 1982; *assistant professor, Pathology, 1987*

Lutz, Thomas M., B.A. Massachusetts 1980, M.A. Stanford 1983, Ph.D. 1988; *assistant professor, English, 1988*

Luxenburg, Norman, A.B. Michigan 1949, A.M. Zurich (Switzerland) 1950, A.M. Michigan 1951, Ph.D. 1956; *professor, Russian, 1967 (1971)*

Lyford, Marjorie, B.S. Minnesota 1939, M.P.H. Michigan 1951; *associate professor emeritus, Nursing, 1953 (1976)*

Lyle, Kim W., B.A. Northern Iowa 1978, M.D. Iowa 1982; *clinical instructor, Psychiatry, 1990*

Lynch, Charles F., B.S. Loras 1974, M.S. Iowa 1979, M.D. 1979, Ph.D. 1984; *assistant professor, Preventive Medicine and Environmental Health/ Pathology, 1988*

Lynch, Richard G., B.A. Missouri 1961, M.D. Rochester 1966; *professor, Pathology, 1981*

Lyne, John R., B.A. Western Kentucky 1971, M.A. Texas 1973, Ph.D. Wisconsin 1978; *associate professor, Communication Studies, 1977 (1982)*

Maas, Meridean L., B.S.N. Iowa 1957, M.A. 1960, Ph.D. Iowa State 1979; *associate professor, Nursing, 1976 (1989)*

Macagno, Enzo Oscar, Engr. National (Argentina) 1939, D.P.S. Grenoble (France) 1953; *professor emeritus, Mechanical Engineering, 1960 (1984)*

Macagno, Matilde C., Prof. National (Argentina) 1940, M.S. Iowa 1958; *assistant professor emeritus, Mathematics, 1957 (1989)*

MacCann, Richard D., A.B. Kansas 1940, M.A. Stanford 1942, Ph.D. Harvard 1951; *professor emeritus, Communication Studies, 1970 (1986)*

MacDonald, Kenneth, B.A. Park 1933, M.S. Iowa 1936, Ph.D. 1939; *associate professor emeritus, Preventive Medicine and Environmental Health, 1939 (1978)*

MacDonald, Scott C., B.A. Cornell 1978, B.D. St. Andrews (United Kingdom) 1981, Ph.D. Cornell 1986; *associate professor, Philosophy, 1985 (1990)*

Macfarlane, Donald E., M.B.B.S. London 1967, Ph.D. 1975; *associate professor, Internal Medicine, 1979 (1986)*

MacGregor, John K., B.A. Cornell (Iowa) 1941, M.D. Columbia 1944; *clinical associate professor emeritus, Surgery, 1974 (1989)*

MacGregor, Paul S., B.A. Cornell 1971, D.O. Osteopathic Medicine and Surgery, 1976; *clinical assistant professor, Urology, 1988*

MacIndoe, John H., A.B. Dartmouth 1965, M.D. Jefferson Medical College 1969; *associate professor, Internal Medicine, 1976 (1982)*

MacNeil, Richard D., B.A. Wisconsin 1970, M.Ed. Springfield 1975, Ph.D. Iowa 1979; *associate professor, Leisure Studies, 1975 (1982)*

MacQueen, John C., A.B. Seattle Pacific 1939, M.D. Kansas 1943; *professor emeritus, Pediatrics, 1949 (1986)*

Madison, Eugene W., B.S. Le Moyne 1956, M.S. Michigan State 1958, Ph.D. Illinois 1966; *professor, Mathematics, 1966 (1982)*

Madison, Kathi C., Sc.B. Brown 1975, M.D. 1978; *associate professor, Dermatology, 1984 (1989)*

Madsen, Donald H., B.S.M.E. Iowa State 1944, M.S.M.E. Purdue 1948, Ph.D. 1953; *professor emeritus, Mechanical Engineering, 1954 (1990)*

Madsen, Douglas K., A.B. Stanford 1961, M.A. California (Los Angeles) 1967, Ph.D. 1973; *professor, Political Science, 1971 (1987)*

Madsen, Mark T., B.S. Wisconsin (Kenosha) 1973, M.S. Wisconsin (Madison) 1975, M.S. 1976, Ph.D. 1979; *assistant professor, Radiology, 1988*

Maher, Dorothy M., B.S. Iowa 1957, B.S.N. St. Louis 1961, M.S. California (San Francisco) 1963, J.D. Iowa 1977; *adjunct assistant professor, Nursing/Pharmacy/Social Work, 1981 (1982)*

Maher, James W., B.S. Randolph-Macon 1970, M.D. Florida 1974; *professor, Surgery, 1985 (1989)*

Mahle, Stephen, B.A. Case Western Reserve 1977, M.A. Ohio State 1984, Ph.D. 1987; *assistant professor, Finance, 1986 (1987)*

Mahoney, Larry T., B.S. Loras 1969, M.D. Iowa 1973; *associate professor, Pediatrics/Preventive Medicine and Environmental Health, 1976 (1986)*

Makar, Adel F., M.B. Assuit (Egypt) 1974; *clinical assistant professor, Pediatrics, 1987*

Maki, Dennis R., B.A. Michigan State 1970, M.A. 1975, Ph.D. Wisconsin 1979; *associate professor, Counselor Education, 1982 (1984)*

Malanson, George P., B.A. Williams 1972, M.S. Utah 1978, Ph.D. California (Los Angeles) 1983; *associate professor, Geography, 1985 (1989)*

Malec, Maureen P., B.S. Illinois (Urbana) 1975, Ph.D. Illinois (Chicago) 1980, M.D. Loyola Stritch School of Medicine (Maywood) 1984; *assistant professor, Obstetrics and Gynecology, 1990*

Malik, Norbert R., B.S. Iowa 1959, M.S.E.E. 1960, Ph.D. Iowa State 1964; *professor, Electrical and Computer Engineering, 1967 (1980)*

Malinow, Roberto, B.A. Reed 1978, M.D. New York 1984, Ph.D. California (Berkeley) 1986; *assistant professor, Physiology and Biophysics, 1990*

Mallik, Usha, B.Sc. Calcutta (India) 1966, M.Sc. Indian Institute of Technology (India) 1968, M.A. City College of CUNY 1972, Ph.D. 1978; *associate professor, Physics and Astronomy, 1988*

Malone, Robert E., B.S. California (Los Angeles) 1970, Ph.D. Oregon 1976; *associate professor, Biology, 1985*

Manderscheid, David C., B.S. Michigan State 1976, Ph.D. Yale 1981; *associate professor, Mathematics, 1983 (1988)*

Mann, Jeanne A., B.A. Texas Tech 1963, M.A. Iowa 1971, M.S.W. 1983; *adjunct instructor, School of Social Work, 1986*

Mannetter, Rebecca S., B.S.N. Iowa 1977, M.A. 1983; *adjunct instructor, Nursing, 1984*

Manning, Raynard, B.S. Iowa 1971, M.A. 1976; *adjunct instructor, Counselor Education, 1987*

Marberry, Charles E., B.A. Illinois 1948, M.A. Stanford 1950, Ph.D. Illinois 1952; *professor emeritus, Finance, 1959 (1986)*

Marchman, James N., B.A. Eastern New Mexico 1966, M.A. Iowa 1968, Ph.D. 1973; *adjunct assistant professor, Psychiatry/Psychology, 1977 (1982)*

Margolin, Leslie H., B.A. Bard 1967, M.S.W. Hunter 1970, Ph.D. Nebraska (Lincoln) 1985; *assistant professor, Home Economics, 1987*

Mark, Allyn L., B.A. Iowa 1957, M.D. 1961; *professor, Internal Medicine, 1967 (1975)*

Markovetz, Allen J., A.B. South Dakota 1957, A.M. 1958, Ph.D. 1961; *professor, Microbiology, 1963 (1973)*

Markovsky, Barry, B.A. Massachusetts 1977, Ph.D. Stanford 1982; *associate professor, Sociology, 1983 (1988)*

Marlin, Robert W., B.S. Iowa State 1969, D.D.S. Iowa 1977; *adjunct assistant professor, Prosthodontics, 1978*

Marsh, J. Lawrence, B.A. Colgate 1975, M.D. Upstate Medical Center 1979; *assistant professor, Orthopaedic Surgery, 1987*

Marshall, Donald G., A.B. Harvard 1965, M.A. Yale 1969, Ph.D. 1971; *professor, English, 1975 (1980)*

Marshall, James D., B.A. Indiana 1972, M.A. Virginia 1975, M.Ed. 1975, Ph.D. Stanford 1985; *associate professor, Curriculum and Instruction/English, 1985 (1990)*

Marshall, Keith M., B.A. Grinnell 1965, M.A. Washington 1967, Ph.D. 1972; *professor, Anthropology, 1972 (1980)*

Marshall, Leslie B., B.A. Grinnell 1965, Ph.D. Washington 1973; *associate professor, Nursing, 1974 (1985)*

Martin, Cleo, B.A. Northern Iowa 1946, M.A. 1954; *assistant professor, Rhetoric/English, 1954 (1974)*

Martin, John, B.S. Lewis Institute 1930, M.S. Northwestern 1934, M.D. 1935, Ph.D. 1941; *clinical professor emeritus, Surgery, 1978 (1990)*

Martin, Kenneth J., A.B. Northern Oklahoma 1975, B.S. Oklahoma State 1977, M.B.A. 1980, Ph.D. Purdue 1987; *assistant professor, Finance, 1987*

Martin, Murray, B.A. Augustana 1939, M.A. Iowa 1945, Ph.D. 1972; *assistant professor emeritus, Curriculum and Instruction, 1960 (1979)*

Martin, Paul J., B.A. Iowa 1964, D.D.S. 1969; *adjunct assistant professor, Operative Dentistry, 1973 (1982)*

Martinet-Moriarty, Francoise; *associate professor, Dance, 1978 (1983)*

Martins, James B., B.A. North Park 1966, M.D. Illinois 1970; *associate professor, Internal Medicine, 1975 (1984)*

Marz, Mark L., D.D.S. Iowa 1978; *adjunct assistant professor, Family Dentistry, 1986*

Maske, Joy, Dipl. Mercy Hospital School of Nursing; *adjunct instructor, Nursing, 1988*

Mason, Charles M., B.A. Iowa 1949, M.A. 1951, Ph.D. 1962; *assistant professor, Planning, Policy and Leadership Studies, 1965*

Mason, Edward E., B.A. Iowa 1943, M.D. 1945, Ph.D. Minnesota 1953; *professor, Surgery, 1953 (1961)*

Massanari, R. Michael, B.A. Goshen 1963, M.D. Northwestern 1967, M.S. Iowa 1985; *associate professor, Internal Medicine/Preventive Medicine and Environmental Health, 1974 (1982)*

Matasar, Richard A., B.A. Pennsylvania 1974, J.D. 1977; *professor, Law, 1980 (1984)*

Mather, Betty L., B.Mus. Oberlin 1949, M.A. Columbia 1951; *professor, School of Music, 1952 (1973)*

Mather, George B., B.A. Iowa 1946, M.A. 1954; *associate professor, Division of Continuing Education, 1949 (1959)*

Mather, Roger F., B.A. Cambridge 1938, M.Sc. Massachusetts Institute of Technology 1940, M.A. Cambridge 1941; *adjunct professor, School of Music, 1973*

Matheson, Lloyd E., B.S. Wisconsin 1964, Ph.D. 1970; *associate professor, Pharmacy, 1975 (1980)*

Mathis, Sally A., B.S.N. Iowa 1975, M.A. 1977; *assistant professor, Nursing, 1981 (1988)*

Matsumoto, Barry D., B.A. Washington 1967, J.D. 1970; *associate professor, Law, 1974*

Matthes, William A., B.A. Knox 1961, M.S. Indiana 1965, Ed.D. 1967; *associate professor, Counselor Education, 1967 (1970)*

Maurer, Richard A., B.S. California (Irvine) 1969, Ph.D. California (Davis) 1973; *professor, Physiology and Biophysics, 1977 (1985)*

Maurer, William C., B.S. Illinois 1954, D.D.S. 1956, M.P.H. Minnesota 1970; *adjunct assistant professor, Preventive and Community Dentistry, 1976*

Max, Jeffrey E., M.B.B.Ch. Witwatersrand (South Africa); *clinical assistant professor, Psychiatry, 1990*

Maxey, E. James, B.S. Illinois State 1957, M.S. Iowa 1959, Ph.D. 1967; *adjunct associate professor, Psychological and Quantitative Foundations, 1957 (1971)*

Maxted, James C., B.S.E.E. Iowa 1974, M.S. 1984; *adjunct instructor, Electrical and Computer Engineering, 1984*

Maynard, Jerry A., B.A. University of Northern Iowa 1958, M.S. Indiana 1961, Ph.D. Iowa 1970; *professor, Exercise Science/Orthopaedic Surgery/Anatomy, 1972 (1981)*

Mays, A. Louise, B.S. Tuskegee 1940, M.A. Chicago 1957; *assistant professor emeritus, School of Social Work, 1972 (1979)*

McAdam, John E., B.S.Ed. Central Missouri State 1934, M.A. Missouri 1940, Ed.D. 1946; *professor emeritus, Curriculum and Instruction/Planning, Policy and Leadership Studies, 1946 (1982)*

McBride, Bunny Allen, B.S. Montana State 1960, M.F.A. Alfred 1970; *professor, School of Art and Art History, 1970 (1985)*

McBride, John, M.A. Illinois 1963, Ph.D. 1967, M.S.W. Iowa 1982; *adjunct instructor, School of Social Work, 1989*

McCabe, Brian F., B.S. Detroit 1950, M.D. Michigan 1954; *professor, Otolaryngology-Head and Neck Surgery, 1964*

McCabe, Donald R., B.S. Iowa 1968, M.D. 1971; *clinical assistant professor, Pediatrics, 1981*

McCarty, William P., B.A. Iowa 1970, M.S.W. 1980; *adjunct instructor, School of Social Work, 1989*

McCauley, Howard W., B.S.C.E. North Dakota State 1948, M.S. Minnesota 1949; *professor emeritus, Civil and Environmental Engineering, 1956 (1990)*

McClelland, Eleanor, B.A. Monmouth 1959, M.P.H. Michigan 1970, Ph.D. Iowa 1979; *associate professor, Nursing, 1971 (1980)*

McCliment, Edward R., B.S.E. Michigan 1956, M.S. Rensselaer Polytechnic 1958, Ph.D. Illinois 1962; *professor, Physics and Astronomy, 1964 (1983)*

McCloskey, Donald N., B.A. Harvard 1964, M.A. 1967, Ph.D. 1970; *John F. Murray professor, Economics/History, 1980*

McCloskey, Joanne M.C., B.S.N. Simmons 1967, M.S.N. Illinois 1972, Ph.D. Chicago 1981; *professor, Nursing, 1980 (1987)*

McCormack, William C., B.S. Bowdoin 1948, M.D. Rochester 1952; *clinical assistant professor, Pediatrics, 1977*

McCormick, George R., B.A. Ohio Wesleyan 1958, M.Sc. Ohio State 1960, Ph.D. 1964; *professor, Geology, 1968 (1976)*

McCubbin, Michael M., B.S. Iowa State 1972, M.D. Iowa 1977; *clinical assistant professor, Pediatrics, 1989*

McCue, James F., A.B. Xavier 1955, M.A. Loyola University of Chicago 1958, Ph.D. Wisconsin 1961; *professor, School of Religion, 1965 (1973)*

McDonald, Bonnie J., B.S. Bradley 1976, M.A. Iowa 1983; *adjunct instructor, Nursing, 1984*

McDonald, Donald B., B.S. Utah 1954, M.S. 1956, Ph.D. 1962; *professor, Civil and Environmental Engineering/Preventive Medicine and Environmental Health, 1962 (1972)*

McDonald, Dorothy T., B.Music Nebraska 1949, M.Ed North Carolina 1963, Ph.D. Ohio State 1970; *professor, Curriculum and Instruction/School of Music, 1970 (1984)*

McDonough, Randal P., B.S.Ph. Iowa 1987; *clinical instructor, Pharmacy, 1988*

McDowell, Frederick P. W., B.S. Pennsylvania 1937, M.A. 1938, M.A. Harvard 1947, Ph.D. 1949; *professor emeritus, English, 1949 (1985)*

McDowell, Margaret B., B.A. Coe 1944, M.A. Iowa 1946, Ph.D. 1954; *professor, Rhetoric, 1967 (1977)*

McFadden, David B., B.S.Ph. Kansas 1974, M.S. Iowa 1976; *adjunct assistant professor, Pharmacy 1988*

McFarland, Guy E., III, B.S. Iowa State 1959, M.D. Iowa 1962, M.S. 1968; *clinical associate professor, Otolaryngology-Head and Neck Surgery, 1972 (1977)*

McGalliard, John C., B.A. North Carolina 1924, M.A. 1925, M.A. Harvard 1929, Ph.D. 1930; *professor emeritus, English, 1931 (1975)*

McGee, Michael C., B.A. Butler 1965, M.A. Cornell 1967, Ph.D. Iowa 1974; *professor, Communication Studies, 1979 (1985)*

McGovern, Eileen, B.A. Mundelein 1961, M.A. St. Louis 1966, Ph.D. 1968, M.S.W. Iowa 1975; *adjunct instructor, School of Social Work, 1988*

McGowan, Dennis P., B.S. Iowa State 1978, M.S.C. Newcastle (England) 1980, M.D. Iowa 1983; *clinical assistant professor, Orthopaedic Surgery/Biomedical Engineering, 1990*

McGowan, Gerald J., B.A. Carroll 1959, M.D. Iowa 1963; *clinical associate professor, Family Practice, 1975 (1980)*

McGowan, Stephen E., A.B. Washington 1972, M.D. Rochester 1976; *associate professor, Internal Medicine, 1986 (1990)*

McGuinness, Gail, A.B. Regis 1968, M.D. Tufts 1972; *professor, Pediatrics, 1976 (1990)*

McKay, Charles R., B.A. Northeastern 1969, M.S. Dalhousie (Canada) 1972, M.D. Boston 1976; *associate professor, Internal Medicine, 1988*

McKay, Kenneth H., M.D. Iowa 1952; *clinical assistant professor, Surgery, 1976*

McKeighen, Rosemary J., B.A. Indiana 1950, B.S.N. California State 1965, M.S. California (Los Angeles) 1967, Ph.D. Texas 1984; *professor emeritus, Nursing, 1975 (1989)*

McKinnon, Archie J., B.A. Wayne State 1949, M.A. 1951, Ed.S. Michigan 1966, Ph.D. 1969; *associate professor emeritus, Curriculum and Instruction, 1969 (1985)*

McKusick, Marshall B., B.A. Minnesota 1952, M.A. 1954, Ph.D. Yale 1960; *associate professor, Anthropology, 1960 (1964)*

McLaughlin, John C., B.M. Eastman School of Music 1948, B.A. Kenyon 1950, M.A. Toledo 1952; Ph.D. Indiana 1961; *professor emeritus, English, 1958 (1986)*

McLeran, Hermine E., B.S. Michigan 1956, M.P.H. 1961; *adjunct associate professor, Preventive and Community Dentistry 1974 (1987)*

McLeran, James, B.A. Simpson 1953, B.S. 1953, D.D.S. Iowa 1957, M.S. 1962; *professor, Oral and Maxillofacial Surgery, 1959 (1972)*

McLure, Gail T., B.A. Alabama 1957, M.Ed. Illinois 1965, Ph.D. Iowa 1973; *adjunct assistant professor, Nursing, 1988*

McLure, John W., B.S. Illinois 1956, M.A. 1961, Ph.D. 1968; *associate professor, Curriculum and Instruction, 1969 (1974)*

McNabb, Scott F., A.B. Earlham College 1968, M.Ed. Harvard 1972, Ph.D. Virginia 1978; *associate professor, Planning, Policy and Leadership Studies, 1979 (1984)*

McNulty, Michael L., B.S. California State (Pennsylvania) 1962, M.A. Northwestern 1964, Ph.D. 1966; *professor, Geography, 1969 (1976)*

McPherson, James A., B.A. Morris Brown 1965, LL.B. Harvard 1968, M.F.A. Iowa 1970; *professor, English, 1981*

Mead, Maurita M., B.M. Eastman School of Music 1976, M.M. Michigan State 1979; *associate professor, School of Music, 1983 (1989)*

Mead, Sidney E., A.B. Redlands 1934, A.M. Chicago 1938, Ph.D. 1940; *professor emeritus, School of Religion/History, 1964 (1972)*

Means, Sharon M., B.A. Northwestern 1966, M.D. Indiana (Indianapolis) 1970; *clinical assistant professor, Pediatrics, 1989*

Megill, Allan D., B.A. Saskatchewan (Canada) 1969, M.A. Toronto (Canada) 1970, Ph.D. Columbia 1975; *professor, History, 1974 (1987)*

Mehta, Maheshkumar P., M.B.B.S. Shivaji (India) 1974; *associate professor, Anesthesia, 1979 (1986)*

Mei, Y. P., B.A. Oberlin 1924, Ph.D. Chicago 1927, LL.D. Oberlin 1943, L.H.D. Wabash 1950; *professor emeritus, Asian Languages and Literature, 1955 (1969)*

Melchert, Thomas E., B.A. Lawrence 1958, M.S. Wisconsin 1960, Ph.D. Texas 1963; *associate professor, Botany, 1963 (1968)*

Melson, Enrico A., A.B. Harvard 1977, M.P.H. California (Berkeley) 1981, M.D. California (Irvine) 1982; *clinical assistant professor, Preventive Medicine and Environmental Health, 1988*

Méndez Rodenas, Adriana, B.A. Cincinnati 1972, M.A. Duke 1974, Ph.D. Cornell 1979; *associate professor, Spanish and Portuguese/Comparative Literature, 1985 (1987)*

Menezes, Arnold H., I.Sc. Bombay (India) 1961, M.B.B.S. 1966; *professor, Surgery, 1974 (1985)*

Menezes, Meenal A., M.B.B.S. Bombay (India) 1967; *clinical assistant professor, Anesthesia, 1972 (1974)*

Menninger, John R., A.B. Harvard 1957, Ph.D. 1964; *professor, Biology, 1972 (1978)*

Merchant, James A., B.S. Iowa State 1962, M.D. Iowa 1966, Dr.P.H. North Carolina 1973; *professor, Preventive Medicine and Environmental Health, 1981*

Meredith, Patricia K., B.S. Iowa 1979, D.D.S. 1983; *adjunct assistant professor, Preventive and Community Dentistry, 1988*

Merker, Karl K., B.A. Illinois College 1952; *professor, English, 1967 (1981)*

Merlino, Robert L., B.S. St. Joseph's 1973, Ph.D. Maryland 1980; *associate professor, Physics and Astronomy, 1981 (1986)*

Mescher, Kay Deegan, B.S. Iowa 1965, M.S. 1975; *associate professor, Dental Hygiene 1965 (1982)*

Messerle, Louis, Sc.B. Brown 1975, Ph.D. Massachusetts Institute of Technology 1979; *associate professor, Chemistry, 1984 (1990)*

Metcalf, Amanda M., B.S. Iowa 1975, M.D. Nebraska 1978; *assistant professor, Surgery, 1987*

Meyer, Jean A., B.S.N. Iowa 1963, M.A. 1985; *adjunct instructor, Nursing, 1984*

Michels, Timothy L., B.S. Drake 1981, D.D.S. Iowa 1985; *adjunct instructor, Family Dentistry, 1987*

Midgett, Douglas K., B.A. Montana 1965, Ph.D. Illinois 1977; *associate professor, Anthropology, 1972 (1980)*

Mielnik, Edward M., B.S.M.E. Iowa 1943, M.S. Massachusetts Institute of Technology 1952; *associate professor emeritus, Chemical and Biochemical Engineering/Industrial and Management Engineering, 1946 (1984)*

Milani, Martha M., B.A. Miami (Florida) 1957, M.A. Iowa 1971, Ph.D. 1982; *adjunct assistant professor, Planning, Policy and Leadership Studies, 1985*

Milavetz, Gary, B.S. Minnesota 1978, Pharm.D. 1980; *assistant professor, Pharmacy, 1981 (1986)*

Milde, Frances K., B.S.N. Missouri (Columbia) 1971, M.S.N. Western Reserve 1974, Ph.D. Iowa 1983; *assistant professor, Nursing, 1974 (1977)*

Milkman, Roger D., A.B. Harvard 1951, A.M. 1954; Ph.D. 1956; *professor, Biology, 1968*

Miller, Arthur H., B.A. Minnesota 1965, M.A. Michigan 1967, Ph.D. 1971; *professor, Political Science, 1985*

Miller, Debra Kay, B.A. Drake 1976, M.D. Iowa 1980; *clinical assistant professor, Pediatrics, 1988*

Miller, Edward C., B.B.A. Hawaii 1979, M.S.B.A. Boston 1983; *assistant professor, Military Science, 1988*

Miller, Franklin, B.A. Oberlin 1962, M.A. Ohio State 1964, M.F.A. 1970; *professor, Communication Studies, 1970 (1982)*

Miller, Thaxter H., D.D.S. Minnesota 1940, M.S. Iowa 1954; *associate professor emeritus, Prosthodontics, 1962 (1986)*

Miller, Thomas W., B.S. Iowa State 1969, M.D. Iowa 1972; *clinical assistant professor, Family Practice, 1984*

Miller-Eldridge, Julie A., B.S. Marquette 1977; *adjunct instructor, Dental Hygiene/Preventive and Community Dentistry, 1990*

Mills, Margaret H., B.A. Iowa 1976, M.A. 1979, Ph.D. 1985; *assistant professor, Russian, 1989*

Mitchell, Daniel M., B.S.E.E. Massachusetts Institute of Technology 1960, M.S.E.E. Iowa State 1966; *adjunct instructor, Electrical and Computer Engineering, 1984*

Mitros, Frank A., B.S. Seton Hall 1965, M.D. New Jersey College of Medicine 1969; *professor, Pathology 1976 (1988)*

Mixdorf, Jay D., B.A. Northern Iowa 1970, M.D. Iowa 1974; *clinical associate professor, Family Practice, 1987*

Mize, Cinda, B.A. Northwestern State (Louisiana) 1960, M.S. Southern Mississippi 1972; *adjunct instructor, Nursing, 1988*

Mobily, Kenneth E., B.A. Kent State 1972, M.A. Iowa 1977, Ph.D. 1981; *associate professor, Leisure Studies/Exercise Science, 1979 (1987)*

Mobily, Paula R., B.S.N. Ohio State 1971, M.S.N. Cincinnati 1986, Ph.D. Iowa 1987; *assistant professor, Nursing, 1976 (1988)*

Mock, Donald M., B.S. Baylor 1968, M.S. Stanford 1969, M.D. Texas Health Science Center (Dallas) 1974, Ph.D. 1978; *professor, Pediatrics, 1985 (1990)*

Moeller, Leslie G., B.A. Iowa 1925, D.Litt. Wartburg 1957; *John F. Murray professor emeritus, School of Journalism and Mass Communication, 1946 (1973)*

Mohler, J. Dawson, A.B. Missouri 1949, A.M. 1950, Ph.D. California (Berkeley) 1955; *professor, Biology, 1966 (1969)*

Moline, David O., D.D.S. Washington 1953; *associate professor, Family Dentistry, 1983 (1987)*

Moll, Kenneth L., B.S.Ed. Southeast Missouri State 1954, M.A. Iowa 1959, Ph.D. 1960; *professor, Speech Pathology and Audiology, 1959 (1968)*

Monserud, Gerald D., B.S. Iowa 1974, D.D.S. 1980; *adjunct assistant professor, Family Dentistry, 1985*

Montgomery, John C., B.A. Missouri 1952, D.D.S. Missouri (Kansas City) 1956, M.S. 1959; *professor, Oral and Maxillofacial Surgery, 1963 (1974)*

Montgomery, Rex, B.Sc. Birmingham (England) 1943, Ph.D. 1946, D.Sc. 1963; *professor, Biochemistry, 1955 (1964)*

Montgomery, S. Kay, B.S.N. Marycrest 1973, M.A. Iowa 1974; *adjunct assistant professor, Nursing, 1984*

Moon, Jerald B., B.S. Western Ontario (Canada) 1978, M.S. 1980, Ph.D. Purdue 1985; *adjunct assistant professor, Speech Pathology and Audiology, 1985*

Moore, Dennis M., B.A. Chicago 1974, M.A. Princeton 1976, Ph.D. 1978; *associate professor, Rhetoric, 1980 (1988)*

Moore, Margaret, B.S.N. Iowa 1958, M.S. Indiana 1962; *adjunct instructor, Nursing, 1984*

Moore, Steven A., B.S. Purdue 1977, Ph.D. Indiana 1980, M.D. 1982; *associate professor, Pathology, 1987 (1990)*

Moore, Timothy E., M.B. Ch.B. Otago (New Zealand) 1971, Kings College 1965; *assistant professor, Radiology, 1988*

Moores, Kevin G., Pharm.D. Nebraska (Omaha) 1979; *adjunct assistant professor, Pharmacy, 1987*

Morgan, Donald P., B.S. Franklin and Marshall 1944, M.S. Northwestern 1949, M.D. Indiana 1947, Ph.D. Northwestern 1953; *professor emeritus, Preventive Medicine and Environmental Health, 1973 (1988)*

Morris, Adalaide, B.A. Wells 1964, M.A. Minnesota 1966, Ph.D. 1972; *professor, English, 1974 (1985)*

Morris, Hughlett, B.A. Iowa 1952, M.A. 1957, Ph.D. 1960; *professor, Otolaryngology-Head and Neck Surgery/Speech Pathology and Audiology, 1957 (1969)*

Morris, Woodrow W., B.A. Michigan State Normal 1935, M.A. Michigan 1939, Ph.D. 1949; *professor emeritus, Medicine/School of Social Work, 1948 (1983)*

Morrison, James D., B.S. Franklin and Marshall 1958, Ph.D. Northwestern 1963; *professor, Chemistry, 1990*

Morriss, Frank H., Jr., B.A. Virginia 1962, M.D. Duke 1966; *professor, Pediatrics, 1987*

Morrissey, Leo J., B.S. Loras 1950, M.A. Iowa 1965; *assistant professor emeritus, Physical Therapy, 1964 (1969)*

Moseley, Pope L., B.S. Davidson 1976, M.D. Illinois 1980, M.S. Iowa 1983; *associate professor, Internal Medicine, 1985 (1990)*

Mosher, Craig R., B.A. Antioch 1966, M.A. Columbia 1968, Ph.D. Union Graduate 1971; *adjunct associate professor, School of Social Work, 1987 (1988)*

Motto, Edwin A., B.S. St. Ambrose 1943, M.D. Loyola 1947; *clinical associate professor, Internal Medicine, 1976*

Mount, Michael K., B.S. Iowa 1973, M.S. Iowa State 1975, Ph.D. 1977; *associate professor, Management and Organizations, 1981 (1986)*

Moye-Rowley, W. Scott, B.S. Illinois (Urbana) 1981, Ph.D. Purdue 1986; *assistant professor, Physiology and Biophysics, 1989*

Moyers, Jack, B.A. Iowa 1943, M.D. 1945; *professor, Anesthesia, 1951 (1966)*

Moyers, John R., B.S. Iowa 1969, M.D. 1973; *professor, Anesthesia, 1979 (1990)*

Muehl, Lois B., B.A. Oberlin 1941, M.A. Iowa 1967; *associate professor emeritus, Rhetoric, 1965 (1985)*

Muehl, Siegmar, M.A. Chicago 1948, M.S. New York State Teachers 1953, Ph.D. Iowa 1959; *professor emeritus, Psychological and Quantitative Foundations, 1958 (1985)*

Mueller, Charles W., B.S. Iowa State 1965, M.S. 1967, Ph.D. Wisconsin 1973; *professor, Sociology, 1972 (1983)*

Muhly, Paul S., B.A. Iowa 1965, M.A. Michigan 1966, Ph.D. 1969; *professor, Mathematics/ Statistics and Actuarial Science, 1969 (1976)*

Muilenburg, Ann C., B.S.N. Iowa 1976, M.A. 1986; *adjunct instructor, Nursing, 1988*

Muir, Robert M., B.A. Wyoming 1938, M.A. Michigan 1941, Ph.D. 1946; *professor emeritus, Botany, 1948 (1988)*

Muirhead, Michael J., B.A. Yale 1971, M.D. Alabama 1974; *assistant professor, Internal Medicine, 1985*

Mulford, Harold A., B.S. Morningside 1947, M.A. Iowa 1950, Ph.D. 1955; *professor, Psychiatry, 1956 (1966)*

Munger, Ronald G., B.S. Kansas State 1977, Ph.D. Washington 1985, M.P.H. 1987; *assistant professor, Preventive Medicine and Environmental Health/Anthropology, 1988*

Muralidharan, Monagur, B.E. Madras 1972, M.Tech. Indian Institute of Technology 1976, Ph.D. 1983; *assistant professor, Computer Science, 1986*

Murhammer, David W., B.S. Oregon State 1979, M.S. 1982, Ph.D. Houston 1989; *assistant professor, Chemical and Biochemical Engineering, 1989*

Murph, Jody R., B.S. Francis Marion 1975, M.D. Medical University of South Carolina 1979, M.S. Iowa 1985; *assistant professor, Pediatrics, 1986*

Murphy, John F., B.A. Iowa 1960, M.D. 1964; *clinical assistant professor, Family Practice, 1979 (1986)*

Murphy, Sean P., B.Sc. London 1972, M.Sc. 1973, Ph.D. Open University 1977; *assistant professor, Pharmacology, 1988*

Murray, David J., M.D. Saskatchewan (Canada) 1978; *associate professor, Anesthesia, 1983 (1990)*

Murray, Jeffrey C., B.S. Massachusetts Institute of Technology 1972, M.D. Tufts 1978; *associate professor, Pediatrics, 1984 (1988)*

Murray, William M., B.S. New Haven Teachers 1956, M.A. Iowa 1958, Ph.D. 1964; *professor, English, 1958 (1974)*

Muston, Alan Lee, B.S.P.H. Southwestern Oklahoma State 1970; *adjunct instructor, Pharmacy, 1977*

Muston, Ray A., B.S. Indiana 1961, M.B.A. 1963, Ed.D. 1970; *associate professor, Planning, Policy and Leadership Studies, 1970 (1975)*

Mutel, Robert L., A.B. Cornell 1968, Ph.D. Colorado 1975; *professor, Physics and Astronomy, 1975 (1986)*

Myers, Glenn A., B.S. Michigan State 1971, M.S. Michigan 1973, Ph.D. California (Berkeley) 1985; *assistant professor, Biomedical Engineering/ Electrical and Computer Engineering, 1986*

Myers, Kay, B.S.N. Ohio State 1959, M.A. Iowa 1978; *adjunct assistant professor, Nursing, 1985*

Myers, Virginia A., B.A. George Washington 1949, M.F.A. California College of Arts 1951; *professor, School of Art and Art History, 1962 (1981)*

Mykleby, Brian A., B.S. Iowa State 1978, D.D.S. Iowa 1981, M.S. 1985; *adjunct assistant professor, Endodontics, 1989*

Nagel, Alan F., A.B. Harvard 1963, M.A. Cornell 1965, Ph.D. 1969; *professor, English/ Comparative Literature, 1968 (1980)*

Nagle, Mary M., B.S.C. Iowa 1945, M.S.W. 1975; *adjunct instructor, School of Social Work, 1984*

Nagoshi, Rodney N., B.A. Pomona 1979, Ph.D. Harvard 1986; *assistant professor, Biology, 1989*

Naides, Stanley J., A.B. Princeton 1974, M.D. Hahnemann 1978; *assistant professor, Internal Medicine, 1986*

Nair, Vasu, B.Sc. Otago (New Zealand) 1963, A.R.A.C.I. Royal Australian Chemical Institute (Australia) 1967, Ph.D. Adelaide (Australia) 1966; *professor, Chemistry, 1969 (1980)*

Nakato, Tatsuaki, B.S. Nagoya (Japan) 1966, M.S. Japan 1968; Ph.D. Iowa 1974; *adjunct associate professor, Civil and Environmental Engineering, 1977 (1990)*

Nash, Larry L., D.D.S. Iowa 1959; *adjunct associate professor, Family Dentistry, 1964 (1981)*

Nassif, Edward G., B.A. Northern Iowa 1971, M.D. Iowa 1975; *clinical assistant professor, Pediatrics, 1981*

Nathan, Peter E., A.B. Harvard 1957, Ph.D. Washington University 1962; *University of Iowa Foundation professor, Psychology, 1990*

Nau, Scott K., B.S. Iowa 1975, M.D. 1978; *clinical assistant professor, Pediatrics, 1989*

Nauseef, William M., B.A. Hamilton 1972, M.D. S.U.N.Y. Upstate Medical Center 1976; *associate professor, Internal Medicine, 1983 (1987)*

Nazareth, Peter F. J., B.A. (Hon.) London (England) 1962, Dipl. Leeds (England) 1965; *professor, English/African-American World Studies, 1973 (1985)*

Neff, John S., B.S. Wisconsin 1957, M.S. 1958, Ph.D. 1961; *professor, Physics and Astronomy, 1964 (1979)*

Nelms, William F., B.A. Minnesota 1974, M.D. 1978; *clinical assistant professor, Surgery, 1985*

Nelson, Edward B., B.S. Western Kentucky State Teachers 1937, M.S. Vanderbilt 1938, Ph.D. Columbia 1949; *professor emeritus, Physics and Astronomy, 1949 (1984)*

Nelson, Forrest D., B.S. Colorado State 1968, M.A. Rochester 1974, Ph.D. 1975; *professor, Economics, 1980 (1989)*

Nelson, George C., B.A. Oberlin 1964, M.S. Case Institute of Technology 1965, Ph.D. 1968; *professor, Mathematics, 1968 (1982)*

Nelson, Herbert L., B.A. Iowa 1943, M.D. 1946; *professor emeritus, Psychiatry, 1963 (1984)*

Nelson, John S., B.A. Kentucky 1971, Ph.D. North Carolina 1977; *professor, Political Science, 1975 (1987)*

Nelson, Kristine E., B.A. Stanford 1965, M.S.W. California (Sacramento) 1970, D.S.W. California (Berkeley) 1980; *associate professor, School of Social Work, 1979 (1985)*

Nelson, Richard P., B.A. Northwestern 1968, M.D. 1972; *associate professor, Pediatrics, 1986*

Nepola, James V., B.S. Yale 1974, M.D. Columbia 1978; *associate professor, Orthopaedic Surgery, 1984 (1989)*

Nerad, Jeffrey A., B.A. California (Los Angeles) 1975, M.D. St. Louis 1979; *associate professor, Ophthalmology, 1985 (1989)*

Nesbitt, John A., B.A. Michigan State 1955, M.A. Columbia 1961, Ed.D. 1968; *professor, Leisure Studies, 1972 (1975)*

Nettleman, Mary D., B.S. Ohio 1977, M.D. Vanderbilt 1981; *assistant professor, Internal Medicine, 1987 (1988)*

Neuhauser, Paul M., B.A. Harvard 1955, LL.B. 1958, LL.M. 1963; *professor, Law, 1963 (1969)*

Neuman, Linda K., B.A. Colorado 1970, J.D. 1973; *adjunct assistant professor, School of Social Work, 1981*

Neumann, George R., B.A. Le Moyne 1968, M.A. Northwestern 1969, Ph.D. 1974; *professor, Economics/Management and Organizations, 1984*

Newcomer, Kermit L., B.Sc.Agr. Ohio State 1952, M.D. Western Reserve 1959; *clinical instructor, Internal Medicine, 1988*

Newman, Kathleen E., B.A. California (Santa Cruz) 1975, M.A. Stanford 1980, Ph.D. 1983; *assistant professor, Spanish and Portuguese, 1988*

Newsom, Charles R., B.S. Texas (Austin) 1974, Ph.D. 1980; *associate professor, Physics and Astronomy, 1985 (1989)*

Newsome, Louane L., B.A. Pomona 1928, M.A. California (Berkeley) 1930; *associate professor emeritus, Curriculum and Instruction/School of Library and Information Science, 1957 (1973)*

Newton, Thomas, B.B.A. Iowa 1972, M.A. 1978, Ph.D. 1983; *adjunct assistant professor, Geography, 1985*

Nibbelink, William H., B.A. Michigan 1961, M.S. Iowa 1965, Ph.D. Ohio State 1971; *professor, Curriculum and Instruction, 1971 (1980)*

Nicholson, Donald P., B.S. Iowa State 1951, B.S.M. South Dakota 1959, M.D. Iowa 1961; *assistant professor, Pathology, 1963 (1965)*

Nicholson, Dwight R., B.S. Wisconsin 1969, Ph.D. California (Berkeley) 1975; *professor, Physics and Astronomy, 1978 (1986)*

Nickelsburg, George W., B.A. Valparaiso 1955, B.D. Concordia Seminary 1960, S.T.M. 1962, Th.D. Harvard 1968; *professor, School of Religion, 1969 (1977)*

Nicknish, Thomas R., B.S. Notre Dame 1957, M.D. Georgetown 1961; *clinical associate professor, Internal Medicine, 1975 (1983)*

Niebyl, Jennifer R., B.Sc. McGill 1963, M.D. Yale 1967; *professor, Obstetrics and Gynecology, 1988*

Nielsen, David H., B.S. Maryland 1965, M.A. 1967, Ph.D. Pennsylvania State 1974; *associate professor, Physical Therapy, 1975 (1981)*

Nielsen-Thompson, Nancy J., B.S. California State (Stanislaus) 1969, M.S. Columbia 1971, M.Phil. 1974, Ph.D. 1979; *associate professor, Dental Hygiene, 1980 (1986)*

Nietupski, John A., B.A. Wisconsin-Madison 1972, M.S. 1974, Ph.D. 1978; *adjunct associate professor, Curriculum and Instruction, 1989*

Nitzke, Everett A., M.D. Iowa 1950; *clinical assistant professor, Pediatrics, 1977*

Nolf, Luther O., B.S. Kansas State 1926, M.S. 1929, Ph.D. Johns Hopkins 1931; *professor emeritus, Biology, 1931 (1970)*

Norbeck, Edwin, B.A. Reed 1952, M.A. Chicago 1956, Ph.D. 1956; *professor, Physics and Astronomy, 1960 (1967)*

Nordquist, Gerald L., B.S.C. Iowa 1953, M.A. 1956, Ph.D. 1960; *professor, Economics, 1958 (1968)*

North, George, D.D.S. Iowa 1960; *adjunct associate professor, Family Dentistry, 1969*

Norton, Dee W., B.S. Illinois State 1947, M.S. Iowa 1950, Ph.D. 1952; *associate professor, Psychology, 1957 (1962)*

Nothnagle, John, B.A. Rochester 1949, Diploma Toulouse (France) 1950, M.A. Wisconsin 1954, Ph.D. 1959; *professor, French and Italian, 1959 (1973)*

Nowak, Arthur J., D.M.D. Pittsburgh 1961, M.A. Columbia 1967, D.M.D. 1971; *professor, Pediatric Dentistry, 1973 (1977)*

Noyes, Russell, Jr., A.B. DePauw 1956, M.D. Indiana 1959; *professor, Psychiatry, 1965 (1978)*

Nybakken, Oscar E., B.A. Luther 1928, M.A. Iowa 1930, Ph.D. 1937; *professor emeritus, Classics, 1931 (1971)*

Oberbillig, Robert C., B.A. Drake 1956, LL.B. 1958; *adjunct assistant professor, School of Social Work, 1981*

Oberg, Edwin N., B.A. Minnesota 1929, M.A. 1932, Ph.D. 1935; *professor emeritus, Mathematics, 1937 (1974)*

Oberley, Larry W., B.A. Northwestern 1968, M.S. Iowa 1970, Ph.D. 1974; *professor, Radiology, 1975 (1986)*

Obermann, C. Esco, B.A. Iowa 1927, M.A. 1930, Ph.D. 1938; *associate professor emeritus, Counselor Education, 1938 (1970)*

Obrecht, Eldon, B.A. Iowa 1940, M.A. 1942, Ph.D. 1950; *professor, School of Music, 1947 (1967)*

O'Brien, Patrick, D.D.S. Iowa 1967; *adjunct associate professor, Family Dentistry, 1975 (1982)*

Ocheltree, Gary A., B.S.Ph. Iowa 1974; *adjunct instructor, Pharmacy, 1988*

Ochs, Donovan J., B.A. Loras 1960, M.A. Iowa 1963, Ph.D. 1966; *professor, Rhetoric/ Communication Studies, 1967 (1975)*

Odgaard, A. Jacob, M.S. Technical University of Denmark 1966, Ph.D. 1970; *professor, Civil and Environmental Engineering, 1977 (1989)*

O'Donnel, Alejandro M., M.D. Buenos Aires (Argentina) 1960; *clinical associate professor, Pediatrics, 1977*

Oehmke, Robert H., B.S. Michigan 1948, M.S. Detroit 1950, Ph.D. Chicago 1954; *professor, Mathematics, 1964*

Oehmke, Theresa M., *adjunct assistant professor, Curriculum and Instruction, 1983*

Oglesby, William B., B.S. Miami 1954, M.S. Indiana 1959, Ph.D. 1967; *associate professor, Psychological and Quantitative Foundations, 1969*

O'Gorman, Richard, B.A. Washington (Missouri) 1955, M.A. 1957, Ph.D. Pennsylvania 1962; *professor, French and Italian, 1967*

O'Hara, Kathleen M., B.A. West Chester 1973, M.A. California (Berkeley) 1977, Ph.D. 1984; *assistant professor, Mathematics, 1985 (1989)*

O'Hara, Michael W., B.A. Memphis State 1974, M.S. Pittsburgh 1978, Ph.D. 1980; *professor, Psychology, 1980 (1990)*

Ohmes, Allen F., B.M. Baldwin Wallace 1953, M.M. Rochester 1959; *professor, School of Music, 1964 (1970)*

Olds, John W., B.S. Iowa State 1956, M.D. Tennessee 1967; *clinical assistant professor, Internal Medicine, 1977*

Olin, William H., D.D.S. Marquette 1947, M.S. Iowa 1948; *professor, Otolaryngology-Head and Neck Surgery/Orthodontics, 1948 (1963)*

Oliver, Denis R., B.S. California State (Long Beach) 1965, Ph.D. Iowa 1971; *professor, Physician Assistant Program, 1971 (1987)*

Olmstead, Karen L., M.S.W. Iowa 1966; *adjunct assistant professor, School of Social Work, 1976 (1986)*

Olson, John D., B.A. Colorado 1964, B.S. North Dakota 1968, M.D. Georgetown 1970, Ph.D. Minnesota 1976; *professor, Pathology, 1981 (1988)*

Olson, Kathryn M., B.A.S. Mt. Mercy 1977, M.A. Iowa 1984; *adjunct instructor, Nursing, 1989*

Olson, Robert A. J., D.M.D. Tufts 1958; *associate professor, Oral and Maxillofacial Surgery, 1979 (1983)*

O'Melia, Michael, B.A. Trinity 1973, M.S.W. Iowa 1982; *adjunct instructor, School of Social Work, 1988*

Onel, Yasar, B.Sc. London (England) 1969, Ph.D. 1975; *associate professor, Physics and Astronomy, 1987*

Opolen, James W., B.S. Iowa State 1972, M.S. 1976, Ph.D 1977, M.D. Miami 1980; *clinical assistant professor, Family Practice, 1985*

Orgren, Carl F., Ph.B. Detroit 1959, A.M.L.S. Michigan 1962, M.A. Detroit 1966, Ph.D. Michigan 1971; *associate professor, School of Library and Information Science, 1970 (1976)*

Osborn, Velva J., B.S. Kansas State 1939, M.A. Chicago 1944, M.A. Illinois 1962, Ph.D. 1965; *professor emeritus, School of Library and Information Science, 1971 (1982)*

Osborne, James W., B.S. Illinois 1949, M.S. 1951, Ph.D. 1955; *professor, Radiology, 1955 (1967)*

Osburn, James O., B.S. Michigan 1939, M.S. 1940, Ph.D. 1944; *professor emeritus, Chemical and Biochemical Engineering, 1946 (1985)*

Ossoinig, Karl C., M.D. Vienna (Austria) 1960; *professor, Ophthalmology, 1971 (1977)*

Oster, Harry, A.B. Harvard 1946, M.B.A. Columbia 1948, M.A. Cornell 1950, Ph.D. 1953; *professor, English, 1963 (1968)*

Ostman, Lars P., M.B. Helsinki (Finland) 1976, M.D. 1981; *assistant professor, Anesthesia, 1989*

Otis, Richard E., M.D. Iowa 1967; *clinical assistant professor, Anesthesia, 1977*

Otte, Diane M., B.S.M. St. Teresa 1973, M.S. Northern Illinois 1980; *adjunct instructor, Nursing, 1987*

Otto, Sue E. Kovacic, B.S. Iowa State 1969, M.A. Iowa 1972, Ph.D. 1977; *adjunct assistant professor, Spanish and Portuguese, 1986*

Overland, Anna E., B.S. Iowa 1934, M.A. Columbia 1949; *associate professor emeritus, Nursing, 1952 (1976)*

Pachow, Wang, B.A. Shanghai (China) 1936, Ph.D. Bombay (India) 1948; *professor emeritus, School of Religion, 1968 (1988)*

Paff, William J., B.A. Wisconsin 1928, M.A. Harvard 1931, Ph.D. 1950; *professor emeritus, English, 1950 (1975)*

Palmer, Charles M., B.A. Grinnell 1961, M.A. Chicago 1964; *adjunct associate professor, School of Social Work, 1975 (1988)*

Palumbo, Louis T., B.S. Loyola 1931, M.S. 1932, M.D. 1934; *clinical professor emeritus, Surgery, 1956 (1977)*

Pantazis, Nicholas J., B.S. Lehigh 1970, Ph.D. Harvard 1977; *associate professor, Anatomy, 1979 (1985)*

Papak, Paul J., B.A. Princeton 1971, J.D. Wisconsin 1975; *clinical professor, Law, 1982 (1989)*

Park, Hee-Chull, M.D. Yonsei (Korea) 1962; *clinical assistant professor, Internal Medicine, 1979*

Park, Hyung-Sik, B.S. Seoul National (Korea) 1974, M.S. Korea Advanced Institute of Science 1976, Ph.D. Northwestern 1986; *assistant professor, Computer Science, 1987*

Park, Joon B., B.S. Boston University 1967, M.S. Massachusetts Institute of Technology 1969, Ph.D. Utah 1972; *professor, Biomedical Engineering/Mechanical Engineering, 1983*

Parker, Loran F., B.A. Iowa 1944, M.D. 1945; *associate professor emeritus, Family Practice, 1971 (1988)*

Parker, Robert Nash, A.B. Brown 1976, M.A. Indiana 1978, Ph.D. Duke 1980; *associate professor, Sociology, 1984 (1986)*

Parkes-Perret, Ford B., B.A. Kent State 1964, M.A. 1966, Ph.D. Michigan State 1971; *associate professor, German, 1969 (1976)*

Parkin, Gene F., B.S. Iowa 1970, M.S. 1971, Ph.D. Stanford 1978; *professor, Civil and Environmental Engineering, 1986 (1988)*

Parrott, Eugene L., B.S. Wisconsin 1949, Ph.D. 1954; *professor, Pharmacy, 1962 (1974)*

Parrott, Ray J., B.A. Cornell (Iowa) 1963, M.A. Michigan 1967, Ph.D. 1974; *professor, Russian, 1971 (1985)*

Parsons, Carol A., A.B. California (Irvine) 1979, M.Pl. Southern California 1981, Ph.D. California (Berkeley) 1987; *adjunct assistant professor, Geography, 1987 (1990)*

Parsons, Mabel H., B.A. Iowa 1933, M.S. 1958; *assistant professor emeritus, Home Economics, 1960 (1979)*

Parton, David A., A.B. Willamette 1953, Ph.D. Duke 1963; *professor, Sociology, 1965 (1976)*

Patel, Virendra C., B.Sc.A.C.G.I. London (England) 1962, Ph.D. Cambridge (England) 1965; *professor, Mechanical Engineering, 1971 (1975)*

Paterson, George W., B.A. Simpson 1952, B.D. Drew Theological Seminary 1955, Ph.D. Iowa 1969; *associate professor, School of Religion/Internal Medicine, 1970 (1975)*

Patil, Shivanand R., B.S. Karnatak (India) 1961, M.S. 1963, Ph.D. Colorado 1969; *professor, Pediatrics, 1977 (1986)*

Patrick, Joseph A., B.F.A. Georgia 1960, M.F.A. Colorado 1962; *professor, School of Art and Art History, 1965 (1984)*

Paul, David M., M.D. Middlesex County 1937; *clinical associate professor, Orthopaedic Surgery, 1956 (1964)*

Paul, Sherman, B.A. Iowa 1941, M.A. Harvard 1948, Ph.D. 1950; *Carver professor emeritus, English, 1946 (1988)*

Paulik, George F., B.A. Washington (St.Louis) 1979, Ph.D. Indiana 1985; *assistant professor, Mathematics, 1986*

Paulson, Wayne L., B.S. Wisconsin 1959, M.S. 1960, Ph.D. Iowa 1965; *professor, Civil and Environmental Engineering, 1960 (1972)*

Pauly, Peter J., D.D.S. Iowa 1978; *adjunct assistant professor, Family Dentistry, 1986*

Pavlovic, Chaslav V., Dipl. Belgrade (Yugoslavia) 1973, M.Sc. Salford (Great Britain) 1979, Ph.D. Wichita State 1982; *associate professor, Speech Pathology and Audiology, 1985*

Payne, Gerald L., B.S. Ohio State 1961, M.S. 1961, Ph.D. California (San Diego) 1967; *professor, Physics and Astronomy, 1969 (1980)*

Pearson, Gerald, A., B.S. California Institute of Technology 1960, Ph.D. Chicago 1965; *adjunct associate professor, Chemistry, 1981*

Pearson, Kent S., B.S. Illinois (Urbana) 1977, M.D. Illinois (Rockford) 1981; *assistant professor, Anesthesia, 1987*

Pelenski, Jaroslaw, Ph.D. Munich (Germany) 1957, Certificate Columbia 1964, Ph.D. 1968; *professor, History, 1967 (1971)*

Pelton, Elizabeth L., B.S. Iowa 1970, M.S. 1974; *associate professor, Dental Hygiene, 1974 (1980)*

Penick, George D., B.S. North Carolina 1944, M.D. Harvard 1946; *professor, Pathology, 1970*

Penick, John, B.S. Miami 1966, M.A. 1969, Ph.D. Florida State 1973; *professor, Curriculum and Instruction, 1975 (1982)*

Penney, Margaret, B.A. St. Joseph's (New York) 1950; *adjunct instructor, School of Social Work, 1987*

Penningroth, R. Paul, B.A. Iowa 1960, M.D. 1964; *clinical assistant professor, Psychiatry, 1965 (1970)*

Perkins, Edward S., M.B.B.S. St. Barthomew's (England) 1947, Ph.D. London 1957, M.D. 1959; *professor emeritus, Ophthalmology, 1979 (1986)*

Perlman, Adrienne L., B.A. Iowa 1963, M.A. Northern Iowa 1976, Ph.D. Iowa 1985; *adjunct assistant professor, Speech Pathology and Audiology/Prosthodontics, 1985*

Perlman, Stanley, B.A. Rochester 1968, Ph.D. Rochester 1968, M.D. Miami 1979; *associate professor, Pediatrics/Microbiology, 1983 (1988)*

Perry, Paul J., B.S. University of the Pacific 1969, M.S. 1971, Ph.D. 1973; *professor, Pharmacy, 1973 (1987)*

Persons, Stow, B.A. Yale 1936, Ph.D. 1940; *Carver professor emeritus, History, 1950 (1981)*

Pessin, Jeffrey E., B.A. Brooklyn 1975, M.A. 1975, Ph.D. Illinois 1980; *associate professor, Physiology and Biophysics, 1983 (1988)*

Peters, Charles, B.A. Harvard 1979, M.D. St. Louis 1983; *assistant professor, Pediatrics, 1989*

Peters, John D., B.A. Utah 1981, M.A. 1982, Ph.D. Stanford 1986; *assistant professor, Communication Studies, 1986*

Petersen, Matthew C., B.M. Iowa 1973, M.D. 1983; *clinical instructor, Family Practice, 1989*

Peterson, Carl M., B.S.Ed. Northwest Missouri State 1965, B.A. 1969, M.D. Missouri 1974; *clinical assistant professor, Surgery, 1980 (1985)*

Peterson, Frank R., B.S. Iowa 1918, M.D. 1920; *professor emeritus, Surgery, 1920 (1972)*

Peterson, Lawrence C., B.S.M.E. General Motors Institute 1962, M.S. Iowa 1970; *associate professor, Family Dentistry, 1973 (1986)*

Peterson, Michael W., B.A. Minnesota 1973, M.D. 1979; *assistant professor, Internal Medicine, 1986 (1987)*

Peterson, Richard E., B.S. Washington 1942, B.M.S. Northwestern 1945, M.D. 1946; *professor, Radiology/Internal Medicine, 1954 (1966)*

Pettengill, Marian M., B.S. Illinois 1964, M.S. Rutgers 1967, Ph.D. Illinois 1987; *adjunct assistant professor, Nursing, 1989*

Pfaller, Michael A., B.A. Linfield 1972, M.D. Washington (St.Louis) 1976; *professor, Pathology, 1983 (1989)*

Pflaum, Ronald T., B.A. St. Olaf 1948, M.S. Purdue 1951, Ph.D. 1953; *professor, Chemistry, 1953 (1963)*

Pfohl, Bruce M., B.A. Graceland 1973, M.D. Iowa 1977; *associate professor, Psychiatry/Preventive Medicine and Environmental Health, 1981 (1986)*

Phair, W. Philip, B.A. Ricker 1941, D.D.S. Iowa 1945, M.P.H. Michigan 1948; *professor emeritus, Preventive and Community Dentistry, 1968 (1983)*

Philibert, Marie B., B.S. Marycrest 1973, M.A. Iowa 1976, Ph.D. 1984; *adjunct assistant professor, Nursing,1985*

Phillips, Darrell G., B.M. Sul Ross State 1952, M.A. Texas 1960, Ph.D. Florida State 1967; *associate professor, Curriculum and Instruction, 1968 (1971)*

Phillips, Kenneth H., B.M. Westminster 1967, M.M. West Virginia 1968, Ph.D. Kent State 1983 *associate professor, Curriculum and Instruction/School of Music, 1985 (1990)*

Phillips, Susan M., B.A. Agnes Scott 1967, M.S. Louisiana State 1971, Ph.D. 1973; *professor, Finance, 1974 (1987)*

Phillips, Timothy L., B.S. Kutztown (Pennsylvania) 1975, M.S. Longwood 1983, Ph.D. Pennsylvania State 1987; *assistant professor, Psychological and Quantitative Foundations, 1987*

Piechowski, Philip A., M.S.W. Minnesota 1976; *adjunct instructor, School of Social Work, 1985*

Pierce, J. Leighton, B.A. Iowa 1981, M.F.A. Syracuse 1984; *associate professor, Communication Studies, 1985 (1990)*

Piersol, Frank A., B.A. Grinnell 1933, M.A. Iowa 1943; *professor emeritus, School of Music, 1967 (1980)*

Pietrzyk, Donald J., B.S. Wayne State 1956, Ph.D. Iowa State 1960; *professor, Chemistry, 1961 (1971)*

Piette, Warren W., B.S. Texas A & M 1972, M.D. Texas 1975; *associate professor, Dermatology, 1982 (1988)*

Pignatiello, Joseph J., B.S. Massachusetts 1976, M.S. Ohio State 1979, Ph.D. 1982; *associate professor, Industrial and Management Engineering/Statistics and Actuarial Science, 1989*

Pinckney, Thomas W., B.A. Drake 1971, M.A. 1973, D.D.S. Iowa 1977; *adjunct assistant professor, Preventive and Community Dentistry, 1985*

Pinkham, Jimmy R., B.S. North Carolina 1966, D.D.S. 1970, M.S.D. 1972; *professor, Pediatric Dentistry, 1972 (1983)*

Piros, James, B.S. Illinois 1967, M.D. 1971; *clinical assistant professor, Internal Medicine, 1977*

Pittman, Von V., A.B. Georgia 1967, M.A. 1972, M.Ed. 1978, Ph.D. 1979; *adjunct assistant professor, Planning, Policy and Leadership Studies, 1988*

Pizzini, Edward L., B.S. Montana State 1963, M.S. Houston 1968, Ph.D. Iowa 1973; *professor, Curriculum and Instruction, 1973 (1990)*

Plapp, Bryce V., B.S. Michigan State 1961, Ph.D. California (Berkeley) 1966; *professor, Biochemistry, 1970 (1979)*

Platz, Charles E., B.A. Kansas 1959, M.D. Chicago 1963; *professor, Pathology, 1975 (1980)*

Pogue, Thomas F., B.S. New Mexico State 1957, M.S. Oklahoma State 1962, M.A. Yale 1963, Ph.D. 1968; *professor, Economics, 1965 (1974)*

Pollard, James W., B.S. Loras 1977, D.D.S. Iowa 1977; *adjunct instructor, Preventive and Community Dentistry, 1979 (1980)*

Polumbaum, Judith, B.A. McGill 1976, M.S.Columbia 1977, Ph.D. Stanford 1989; *assistant professor, Journalism and Mass Communication, 1989*

Polyzou, Wayne N., B.S. Pennsylvania State 1974, M.S. Maryland 1978, Ph.D. 1979; *associate professor, Physics and Astronomy, 1982 (1986)*

Pomrehn, Paul R., Jr., B.S. Iowa 1971, M.D. 1975, M.S. 1979; *associate professor, Preventive Medicine and Environmental Health, 1980 (1986)*

Ponseti, Ignacio V., B.S. Barcelona (Spain) 1932, M.D. 1936; *professor emeritus, Orthopaedic Surgery, 1945 (1984)*

Ponto, James Allen, B.S. Iowa 1977, M.S. Southern California 1978; *clinical associate professor, Pharmacy, 1978 (1984)*

Ponzer, Richard, B.S. Bradley 1967, M.A. Northern Illinois 1971, M.S.W. Alabama 1975; *adjunct instructor, School of Social Work, 1982*

Pope, Hallowell, B.A. Chicago 1951, M.A. 1957, Ph.D. Michigan 1963; *associate professor, Sociology, 1968*

Pope-Davis, Donald B., B.S. Illinois Benedictine 1976, M.S. Indiana 1978, Ph.D. Stanford 1989; *assistant professor, Psychological and Quantitative Foundations, 1989*

Popendorf, William J., B.S. California (Berkeley) 1965, M.S. 1970, M.P.H. 1971, Ph.D. 1976; *professor, Preventive Medicine and Environmental Health, 1982 (1989)*

Porter, Samuel D., A.B. Grinnell 1956, M.D. Creighton 1960; *clinical associate professor, Surgery, 1974 (1985)*

Posner, Edward, Jr., B.S. Notre Dame 1946, M.D. Loyola 1943; *clinical assistant professor emeritus, Internal Medicine, 1963 (1986)*

Potra, Florian-Alexandru, M.A. Babes-Bolyia (Romania) 1973, Ph.D. Bucharest 1980; *professor, Mathematics, 1984 (1990)*

Poulton, Jonathan E., B.A. Oxford (England) 1971, M.A. 1974, D.Phil. 1974; *associate professor, Botany, 1979 (1985)*

Powell, Marcus P., B.S. Iowa State 1934, M.S. Iowa 1941, B.S.C.E. 1942; *associate professor emeritus, Preventive Medicine and Environmental Health/Civil and Environmental Engineering, 1943 (1976)*

Powell, Sandra R., B.A. Coe 1963, M.Ed. Columbia (Teachers College) 1969; *associate professor, Nursing, 1969 (1980)*

Preucil, William W., B.M. Eastman School of Music 1952, M.M. Rochester 1956; *professor, School of Music, 1958 (1971)*

Price, David H., B.S. North Carolina State 1975, Ph.D. Florida State 1980; *assistant professor, Biochemistry, 1989*

Price, James L., B.S. Ohio State 1950, M.A. Illinois 1954, Ph.D. Columbia 1962; *professor, Sociology, 1966 (1969)*

Pries, Chris M., B.S. Maryland 1971, M.A. Iowa 1975; *adjunct instructor, Nursing, 1983*

Puhl, James J., B.S. Notre Dame 1965, M.D. Iowa 1968; *clinical assistant professor, Orthopaedic Surgery, 1978*

Puhl, Susan C., B.A. Iowa 1966, M.D. 1969; *clinical assistant professor, Dermatology, 1979 (1985)*

Pulido, Jose S., B.A. Chicago 1976, M.S. 1977, M.D. Tulane 1981; *assistant professor, Ophthalmology, 1987*

Pullen, James J., B.A. Morningside 1967, B.D. Southern Methodist 1970, M.D. Iowa 1974; *clinical assistant professor, Psychiatry, 1984*

Pusack, James P., B.A. Johns Hopkins 1967, M.A. 1967, Ph.D. Indiana 1977; *associate professor, German, 1974 (1981)*

Pyevich, Daniel J., B.S. Illinois 1970, D.D.S. 1972, M.S. 1974; *adjunct assistant professor, Orthodontics, 1989*

Quinn, Daniel M., B.S. Quincy 1972, Ph.D. Kansas 1977; *associate professor, Chemistry, 1982 (1987)*

Rabinovitz, Lauren, B.S. Boston University 1972, M.A. Texas (Austin) 1977, Ph.D. 1982; *associate professor, American Studies/Communication Studies, 1986 (1990)*

Rachow, John W., B.S. Nebraska (Lincoln) 1967, M.S. 1969, Ph.D. 1976, M.D. Nebraska (Omaha) 1976; *assistant professor, Internal Medicine, 1988*

Radia, Mary A., B.S. Drake 1977, D.O. College of Osteopathic Medicine and Surgery 1981; *clinical instructor, Internal Medicine, 1988*

Raeburn, John H., A.B. Indiana 1963, Ph.D. Pennsylvania 1969; *professor, English/American Studies, 1974 (1983)*

Rajagopal, Rangaswamy, B.S. Bombay (India) 1964, M.E. Florida 1969, Ph.D. Michigan 1973; *professor, Geography/Civil and Environmental Engineering, 1979 (1987)*

Rajcevich, Kathleen, B.S.N. Iowa 1970, M.S.N. Nebraska 1976; *adjunct instructor, Nursing, 1984*

Randall, Walter L., B.A. Louisville 1957, Ph.D. Chicago 1961; *professor, Psychology, 1965 (1975)*

Randell, Richard C., B.A. Iowa 1968, M.A. Wisconsin 1971, Ph.D. 1973; *professor, Mathematics, 1981 (1987)*

Randich, Alan, B.A. Syracuse 1972, M.S. 1975, Ph.D. Dalhousie (Canada) 1978; *professor, Psychology, 1979 (1990)*

Rapaport, Herman, B.A. California State (Fullerton) 1969, M.A. California (Los Angeles) 1970, Ph.D. California (Irvine) 1978; *professor, English/Comparative Literature, 1984 (1989)*

Rasley, Dorothy A., Dipl. Iowa 1951; *adjunct instructor, Nursing, 1988*

Rasmussen, Etta H., B.A. Cornell 1932, M.S. Iowa 1957; *associate professor emeritus, Nursing, 1952 (1981)*

Ratermanis, J. B., B.A. Lycee de Tourcoing (France) 1925, M.A. Latvia 1933, Ph.D. 1944; *professor emeritus, French and Italian, 1950 (1972)*

Rattner, Diane, B.A. Iowa 1959, M.S.W. 1966; *adjunct instructor, School of Social Work, 1980*

Rauch, Joseph W., D.D.S. Iowa 1983; *adjunct instructor, Preventive and Community Dentistry, 1984*

Rawlings, Hunter R., III, B.A. Haverford 1966, Ph.D. Princeton 1970; *professor, Classics, 1988*

Ray, D. Dean, B. S. Tarkio 1952, D.D.S. Missouri 1956; *adjunct assistant professor, Preventive and Community Dentistry, 1976*

Ray, Thomas L., B.A. Williams 1968, M.D. Oregon 1972; *associate professor, Dermatology, 1979 (1983)*

Rea, Robert F., B.A. Vanderbilt 1973, M.D. George Washington 1978; *assistant professor, Internal Medicine, 1988*

Read, Charles H., B.Sc. Acadia (Nova Scotia) 1939, M.D. McGill (Canada) 1943; *professor emeritus, Pediatrics, 1954 (1986)*

Reagan, Mark K., B.A. California (Santa Barbara) 1978, M.S. Arizona 1982, Ph.D. California (Santa Cruz) 1987; *assistant professor, Geology, 1987*

Reagen, Michael, B.S. Fordham 1964, M.S. Illinois 1965, Ph.D. Syracuse 1972; *adjunct assistant professor, Hospital and Health Administration, 1982 (1984)*

Rebouche, Charles J., B.S. Tulane 1970, Ph.D. Vanderbilt 1974; *associate professor, Pediatrics, 1984 (1988)*

Recinos, Pablo R., B.S. Instituto Nacional de Varones (Guatemala) 1957, M.D. San Carlos (Guatemala) 1966; *clinical assistant professor, Surgery, 1979*

Reddy, Sudhakar M., B.S.E.E. Osmania (India) 1962, M.E. Indian Institute of Science (India) 1963, Ph.D. Iowa 1968; *professor, Electrical and Computer Engineering, 1968 (1977)*

Reed, Ladonna K., B.A. Mount Mercy 1970, M.S.W. Iowa 1981; *adjunct instructor, School of Social Work, 1986*

Reese, Jean L., B.S.N. Nebraska 1961, M.N. Washington 1968, Ph.D. Iowa 1984; *associate professor, Nursing, 1969 (1980)*

Reimer, Toni Tripp, B.S.N. Maryland 1969, M.S.N. Ohio State 1973, M.A. 1974, Ph.D. 1977; *professor, Nursing/Anthropology, 1977 (1986)*

Reinganum, Jennifer F., B.A. Oberlin 1976, M.S. Northwestern 1978, Ph.D. 1979; *professor, Economics/Management Sciences, 1987*

Reinganum, Marc R., A.B. Oberlin 1975, M.B.A. Chicago 1977, Ph.D. 1979; *Chester Phillips professor, Finance, 1987*

Reinhardt, John W., B.A. Illinois Wesleyan 1971, D.D.S. Loyola 1975, M.S. Iowa 1979, M.P.H. Harvard 1988; *professor, Operative Dentistry, 1977 (1990)*

Reisinger, William M., B.A. Oregon 1979, M.A. Michigan 1981, Ph.D. 1986; *associate professor, Political Science, 1985 (1990)*

Reiter, Robert C., B.A. Texas (Austin) 1977, M.D. Baylor 1981; *assistant professor, Obstetrics and Gynecology, 1989*

Reitz, John C., B.A. Harvard 1970, J.D. Michigan 1975; *professor, Law, 1983 (1988)*

Remington, Richard D., B.A. Montana 1952, M.A. 1954, M.P.H. Michigan 1957, Ph.D. 1958; *University of Iowa Foundation professor, Preventive Medicine and Environmental Health/Preventive and Community Dentistry, 1982*

Renfrew, Donald L., B.A. Grinnell 1978, M.D. Iowa 1982; *assistant professor, Radiology, 1989*

Rethwisch, David G., B.S. Iowa 1979, Ph.D. Wisconsin (Madison) 1985; *associate professor, Chemical and Biochemical Engineering, 1985 (1990)*

Retish, Paul M., B.S. New York State (Geneseo) 1960, M.S. Indiana 1965, Ed.D. 1967; *professor, Curriculum and Instruction, 1967 (1976)*

Reynolds, David R., B.S. Pennsylvania State 1962, M.S. Northwestern 1963, Ph.D. 1966; *professor, Geography, 1968 (1974)*

Rezai, Karim, M.D. Shiraz Medical School (Iran) 1971; *associate professor, Radiology, 1984 (1988)*

Rhead, William J., B.A. California (San Diego) 1968, M.Ph. Yale 1969, M.D. 1974, Ph.D. 1974; *professor, Pediatrics, 1979 (1989)*

Rhodes, Ann, B.S.N. St. Teresa 1975, M.A. Iowa 1976, J.D. 1982; *adjunct assistant professor, Nursing, 1983 (1986)*

Rhodes, Richard S., B.S. Michigan 1969, Ph.D. Iowa 1982; *adjunct assistant professor, Geology, 1983*

Rhyne, Janie, B.A. Florida State 1935, M.A. 1956, Ph.D. California (Santa Cruz) 1979; *adjunct associate professor, School of Social Work, 1982 (1988)*

Riccolo, Diane, B.S.M. Iowa 1972, M.A. 1986; *adjunct instructor, Nursing, 1987*

Rice, James G., Jr., B.A. Macalester 1968, M.L.S. Indiana 1972, Ph.D. Missouri (Columbia) 1968; *associate professor, School of Library and Information Science, 1982 (1984)*

Richards, Anita, B.A. Northern Iowa 1963, M.S.W. Iowa 1980; *adjunct assistant professor, School of Social Work, 1988*

Richards, Wilma, B.S. Drake 1980, M.S.W. Iowa 1982; *adjunct instructor, School of Social Work, 1988*

Richardson, Robert L., D.M.D. Louisville 1944, M.S. Iowa 1953; *associate professor emeritus, Microbiology, 1951 (1984)*

Richerson, Hal B., B.S. Arizona 1950, M.D. Northwestern 1954; *professor, Internal Medicine, 1964 (1974)*

Richman, Lynn C., B.A. Grinnell 1967, M.A. Iowa 1970, Ph.D. 1973; *professor, Pediatrics, 1973 (1984)*

Riddle, Fred A., B.S. Iowa 1965, D.D.S. 1970; *adjunct associate professor, Family Dentistry, 1970 (1982)*

Ridgeway, Cecilia L., B.A. Michigan 1967, M.A. Cornell 1969, Ph.D. 1972; *professor, Sociology, 1985 (1986)*

Riesz, Peter C., B.S. Rutgers 1958, M.B.A. Columbia 1963, Ph.D. 1971; *professor, Marketing, 1968 (1980)*

Riezman, Raymond G., B.A. Washington (Missouri) 1969, Ph.D. Minnesota 1977; *professor, Economics, 1976 (1990)*

Riggs, Charles E., Jr., B.A. Johns Hopkins 1972, M.D. 1976; *associate professor, Internal Medicine, 1983 (1990)*

Righter, Charles B., B.Mus. Nebraska 1917, B.F.A. 1926; *associate professor emeritus, School of Music, 1930 (1964)*

Riley, Edgar F., Jr., B.A. Wisconsin 1938, Ph.D. Iowa 1953; *professor emeritus, Radiology, 1953 (1985)*

Riley, Vernette, B.S.N. Iowa, M.A.; *adjunct instructor, Nursing, 1985*

Riley, Walter J., B.S. Fort Valley State 1960, M.D. Meharry Medical 1964; *clinical assistant professor, Surgery, 1971 (1974)*

Rim, Kwan, B.S.M.E. Tri-State 1955, M.S.M.E. Northwestern 1958, Ph.D. 1960; *professor, Biomedical Engineering/Mechanical Engineering/Orthopaedic Surgery, 1960 (1968)*

Rinehart, Judith, B.A. Central 1966, M.S.W. Iowa 1970; *adjunct assistant professor, School of Social Work, 1978 (1979)*

Ringen, Catherine, B.A. Indiana 1970, M.A. 1972, Ph.D. 1975; *professor, Linguistics, 1975 (1988)*

Ringo, Elbert W., B.A. Park 1927, M.A. Middlebury 1929, Ph.D. Illinois 1950; *professor emeritus, Spanish and Portuguese, 1945 (1974)*

River, George L., A.B. Chicago 1952, M.D. Loyola-Stritch 1956; *clinical assistant professor, Internal Medicine, 1978*

Rivera, Eric M., B.A. North Carolina (Chapel Hill) 1981, D.D.S. 1985, M.S. 1989; *assistant professor, Endodontics, 1989*

Rizzo, Louis, B.S. Massachusetts Institute of Technology 1981, M.S. George Washington 1986, Ph.D. Chicago 1989; *assistant professor, Statistics and Actuarial Science, 1989*

Rizzo, Matthew, A.B. Columbia 1975, M.D. Johns Hopkins 1979; *associate professor, Neurology, 1985 (1990)*

Roberson, Joyce, B.S.N. Iowa 1958, M.A. 1975, Ph.D. 1983; *assistant professor, Nursing, 1983 (1989)*

Roberts, Allen F., B.A. Amherst 1968, M.A. Chicago 1972, Ph.D. 1980; *associate professor, Anthropology/African-American World Studies, 1988*

Roberts, Ann M., B.A. Johns Hopkins 1974, M.A. Pennsylvania 1977, Ph.D. 1982; *assistant professor, School of Art and Art History, 1983*

Roberts, Perry V., B.A. Wheaton 1972, M.A. 1982; *professor, Military Science, 1990*

Roberts, Ralph R., Jr., B.A. Lebanon Valley 1950, M.A. Missouri 1961, Ph.D. Southern Illinois 1962; *associate professor, Counselor Education, 1968 (1970)*

Roberts, Rebecca S., B.A. California State 1969, M.S. Oregon State 1976, Ph.D. 1982; *assistant professor, Geography, 1987 (1989)*

Robertson, Maureen, B.A. Indiana 1958, M.A. 1960, Ph.D. Washington 1970; *associate professor, Asian Languages and Literature/Comparative Literature, 1976*

Robertson, Timothy J., B.A. Missouri 1959, M.A. 1961, Ph.D. 1966; *professor, Statistics and Actuarial Science, 1965 (1974)*

Robillard, Jean, B.A. Montreal (Canada) 1964, M.D. 1968; *professor, Pediatrics, 1974 (1982)*

Robin, Donald A., B.A. Boston University 1976, M.S. Redlands 1981, Ph.D. Case Western Reserve 1984; *associate professor, Speech Pathology and Audiology, 1984 (1990)*

Robinson, Arlyn K., B.S. Upper Iowa 1973, D.D.S. Iowa 1977; *adjunct associate professor, Family Dentistry, 1978 (1982)*

Robinson, John P., B.S. Iowa 1960, M.A. Princeton 1962, Ph.D. 1966; *professor, Electrical and Computer Engineering, 1965 (1972)*

Robinson, Robert A., B.A. Missouri 1976, M.D. 1976, Ph.D. Minnesota 1982; *associate professor, Pathology, 1982 (1987)*

Rock, Mary E., B.S. Washington (Missouri) 1949, M.A. Iowa 1960; *assistant professor emeritus, Nursing, 1956 (1971)*

Rocklin, Thomas R., A.B. California (Berkeley) 1977, M.S. Northwestern 1980, Ph.D. 1981; *associate professor, Psychological and Quantitative Foundations, 1987 (1988)*

Rockwell, Lauralee K., B.A. Asbury 1947, M.A. Wisconsin (Platteville) 1967, Ph.D. Wisconsin 1974; *associate professor emeritus, Counselor Education, 1974 (1989)*

Rodgers, Louis D., M.D. Iowa 1960; *clinical associate professor, Surgery, 1982*

Rodgers, Victor G. J., B.Ch.E. Dayton 1980, M.S.Ch.E. Pittsburgh 1985, D.Sc. Washington University 1989; *assistant professor, Chemical and Biochemical Engineering, 1989*

Rodgers, Vincent G.J., B.S. Dayton 1980, M.S. Syracuse 1982, Ph.D. 1985; *assistant professor, Physics and Astronomy, 1989*

Rodnitzky, Robert L., B.S. Chicago 1963, M.D. 1966; *professor, Neurology, 1972 (1982)*

Rodriguez, Jose E., B.S. Yale 1955, Ph.D. Pennsylvania 1963; *associate professor, Microbiology, 1968 (1974)*

Roehm, Stephen C., D.D.S. Illinois (Urbana) 1977, M.S. St. Louis University 1979; *adjunct assistant professor, Orthodontics, 1989*

Roethke, Linda, B.S. Wisconsin (Platteville) 1977, M.F.A. Iowa 1982; *assistant professor, Theatre Arts, 1986*

Rogers, Keith L., B.S. Creighton 1978, M.D. Iowa 1978; *assistant professor, Psychiatry, 1987 (1988)*

Rogers, Rebecca, A.B. Harvard 1981, Ph.D. Ecole des Hautes Etudes (France) 1987; *assistant professor, History, 1989*

Rogovin, Howard, B.S. Northwestern 1949, M.F.A. Colorado 1959; *professor, School of Art and Art History, 1969 (1984)*

Rohlich, Thomas H., B.A. Wisconsin 1971, M.A. 1975, Ph.D. 1979; *associate professor, Asian Languages and Literature, 1982 (1985)*

Rohovit, Duane L., B.A. Iowa 1972, J.D. 1974; *adjunct assistant professor, Nursing, 1983*

Rohrbough, Malcolm J., A.B. Harvard 1954, M.A. Wisconsin 1958, Ph.D. 1963; *professor, History, 1964 (1971)*

Rohrer, James E., B.S. Indiana 1978, M.S. Cincinnati 1981, Ph.D. Michigan 1985; *associate professor, Hospital and Health Administration, 1985 (1990)*

Roller, Cathy M., B.A. Mount Union 1969, M.A. Tulsa 1974, Ph.D. Minnesota 1979; *associate professor, Curriculum and Instruction, 1979 (1985)*

Rooney, Phyllis Ann, B.A. Trinity (Ireland) 1975, M.A. California (Berkeley) 1978, Ph.D. 1982; *adjunct assistant professor, Women's Studies, 1982 (1990)*

Rorex, Robert A., B.A. Hendrix 1956, M.F.A. Princeton 1968, Ph.D. 1975; *associate professor, School of Art and Art History, 1970 (1979)*

Rosazza, John P., B.S. Connecticut 1962, M.S. 1966, Ph.D. 1968; *professor, Pharmacy, 1969 (1977)*

Rose, Earl F., B.A. Yankton 1949, B.S. South Dakota 1951, M.D. Nebraska 1953, LL.B. Southern Methodist 1967; *professor emeritus, Pathology, 1968 (1989)*

Rose, Gerald L., B.A. Minnesota 1960, M.I.L.R. Cornell 1962, Ph.D. California (Berkeley) 1969; *professor, Management and Organizations, 1967 (1982)*

Rose, Rosalie, B.S.N. Iowa 1973; *adjunct instructor, Nursing, 1987*

Roseman, Dennis M., B.S. Wisconsin 1961, M.S. 1962, Ph.D. Michigan 1968; *associate professor, Mathematics, 1970 (1976)*

Rosenbaum, Milton E., B.S.S. City College of New York 1948, M.S. 1949, Ph.D. Texas 1954; *professor, Psychology, 1957 (1966)*

Rosenberg, Harlan K., M.D. Iowa 1957; *clinical associate professor, Urology, 1985*

Rosenberg, Harry W., D.D.S. Iowa 1959; *adjunct associate professor, Family Dentistry, 1975 (1985)*

Rosenberger, Thomas G., A.B. Ohio 1966, M.D. Cincinnati 1970; *clinical assistant professor, Pediatrics, 1975*

Rosenfeld, William C., M.D. Iowa 1961; *clinical associate professor, Internal Medicine, 1977 (1986)*

Rosenthal, David M., B.A. Bradley 1970, M.S. Brooklyn 1974, Ph.D. New York (Buffalo) 1978; *associate professor, Family Practice/Counselor Education, 1978 (1982)*

Rosner, Sue R., B.S. Northwestern 1951, M.A. Wesleyan 1966, Ph.D. Connecticut 1969; *associate professor emeritus, Psychology, 1969 (1989)*

Ross, Alan F., B.A. California (Berkeley) 1976, M.D. Northwestern 1980; *assistant professor, Anesthesia, 1989*

Ross, Jo Ellen, B.S.N. Iowa 1972, M.A. 1977; *adjunct instructor, Nursing, 1982*

Ross, Russell M., B.S. Iowa 1942, M.A. 1946, Ph.D. 1948; *professor, Political Science, 1948 (1965)*

Rossen, James D., B.S. Michigan 1975, M.D. Chicago 1980; *assistant professor, Internal Medicine, 1988*

Rossi, Nicholas P., A.B. Pennsylvania 1951, M.D. Hahnemann Medical 1955; *professor, Surgery, 1960 (1972)*

Roth, Gary D., D.D.S. Iowa 1981; *adjunct assistant professor, Family Dentistry, 1986*

Rothenbuhler, Eric W., B.A. Ohio State 1980, M.A. 1982, Ph.D. Southern California 1985; *assistant professor, Communication Studies, 1985*

Rouse, Hunter, B.S. Massachusetts Institute of Technology 1929, M.S. 1932, Dr.-Ing. Technical University of Karlsruhe (Germany) 1932, Dr.ès.Sci. Physiques Paris 1959; *Carver professor emeritus, Civil and Environmental Engineering, 1939 (1974)*

Routh, Joseph I., B.S.Ch.E. Purdue 1933, M.S. 1934, Ph.D. Michigan 1937; *professor emeritus, Biochemistry/Pathology, 1937 (1978)*

Rovner, Michael J., B.S. Iowa 1973, D.D.S. 1976, M.S. 1978; *adjunct associate professor, Preventive and Community Dentistry, 1978 (1989)*

Rowat, Jane A., B.S. Iowa 1973, M.S. 1982; *clinical assistant professor, Dental Hygiene, 1982 (1989)*

Rowland, Betty H., B.S.Ph. Mississippi 1965, M.S. 1968; *clinical assistant professor, Pharmacy, 1979*

Rowland, Clayton R., B.S. South Carolina 1965, M.S. Ohio State 1968, Ph.D. Mississippi 1972; *associate professor, Pharmacy 1979 (1980)*

Rowley, Vinton N., B.A. Central 1950, M.A. Iowa 1954, Ph.D. 1958; *professor, Pediatrics, 1957 (1968)*

Roy, Christopher, B.A. St. Lawrence 1970, M.A. Indiana 1975, Ph.D. 1979; *associate professor, School of Art and Art History, 1978 (1984)*

Rubenstein, Peter A., A.B. California 1968, M.A. Harvard 1971, Ph.D. 1973; *professor, Biochemistry, 1977 (1987)*

Rubright, William C., A.B. Westminster (Missouri) 1957, D.D.S. Missouri 1962, M.S. 1964, M.S. Chicago 1965; *professor, Periodontics, 1967 (1979)*

Rucinski, Dianne M., B.S. Illinois (Urbana) 1984, M.A. Wisconsin (Madison) 1987, Ph.D. 1989; *assistant professor, Communication Studies, 1989*

Runge, Richard M., B.A. Iowa 1961, M.A. 1963, Ph.D. 1967; *associate professor, German, 1964 (1974)*

Runyan, Raymond B., B.A. Macalester 1972, M.S. Florida State 1976, Ph.D. Texas Tech 1983; *assistant professor, Anatomy, 1986*

Ruppel, Barbara, B.A. St. Charles 1967, M.S.W. Iowa 1978; *adjunct instructor, School of Social Work, 1988*

Ruppel, Howard, B.A. St. Joseph's 1963, M.A. Northern Illinois 1968; *adjunct associate professor, School of Social Work, 1980*

Ruprecht, Axel, D.D.S. Toronto 1968, M.Sc.D. 1972; *professor, Oral Pathology and Diagnosis, 1988*

Rus, Theodor, D.Math Romanian Academy 1965; *associate professor, Computer Science, 1982*

Rushton, Gerard, B.A. Wales (United Kingdom) 1959, M.A. 1962, Ph.D. Iowa 1964; *professor, Geography, 1969 (1974)*

Russell, Daniel W., B.S. Tulsa 1975, M.A. California (Los Angeles) 1976, Ph.D. 1980; *associate professor, Hospital and Health Administration, 1979 (1987)*

Russell, Marilyn A., B.S.N. Iowa 1963, M.S. Minnesota 1967; *adjunct assistant professor, Nursing, 1987*

Russo, Andrew F., B.A. California (San Diego) 1979, Ph.D. California (Berkeley) 1984; *assistant professor, Physiology and Biophysics, 1988*

Russo, Ralph P., B.A. S.U.N.Y. (Binghamton) 1974, Ph.D. 1980; *associate professor, Statistics and Actuarial Science, 1983 (1986)*

Rust, David L., B.A. Northern Iowa 1971, M.S.W. Iowa 1980; *adjunct instructor, School of Social Work, 1986*

Ruther, Lavonne M., B.S.N. Iowa 1965, M.A. 1969; *assistant professor, Nursing, 1969 (1971)*

Ryals, Tony J., B.S. Old Dominion 1974, M.D. Eastern Virginia Medical 1977; *assistant professor, Radiology, 1989*

Ryther, Jeffrey S., B.S. Wisconsin (Oshkosh) 1977, D.D.S. Marquette 1981, M.S. Iowa 1989; *assistant professor, Prosthodontics, 1989 (1990)*

Rzonca, Chester S., B.S. Central Connecticut State 1965, M.A. Morehead State 1967, Ed.D. Illinois 1972; *associate professor, Planning, Policy and Leadership Studies, 1972 (1977)*

Sa-Aadu, Jarjisu, B.S. University of Science and Technology (Ghana) 1973, M.S. Wisconsin 1976, Ph.D. 1980; *associate professor, Finance, 1981 (1988)*

Sabiston, Charles B., B.S. Wake Forest 1953, D.D.S. North Carolina 1957, Ph.D. Virginia 1968; *professor, Family Dentistry, 1972 (1977)*

Saboe, Beverly J., B.S.N. Iowa 1965, M.N. Washington 1971; *assistant professor, Nursing, 1968 (1973)*

Sagen, H. Bradley, B.A. Grinnell 1957, Ph.D. Minnesota 1962; *professor, Planning, Policy and Leadership Studies, 1964 (1973)*

Saks, Michael J., B.A. Pennsylvania State 1969, B.S. 1969, M.A. Ohio State 1972, Ph.D. 1975, M.S.L. Yale 1983; *professor, Law, 1988*

Samatar, Abdi Ismail, B.A. Wisconsin (LaCrosse) 1978, M.C.R.P. Iowa State 1981, Ph.D. California (Berkeley) 1985; *assistant professor, Geography/Urban and Regional Planning, 1985 (1988)*

Sanders, Kathleen D., B.S. American 1970, M.D. California (Los Angeles) 1976; *assistant professor, Pediatrics, 1988*

Sando, Kenneth M., B.Chem. Minnesota 1961, Ph.D. Wisconsin 1968; *professor, Chemistry, 1969 (1982)*

Sandra, Alexander, B.S. Loyola 1968, M.S. DePaul 1972, Ph.D. Case Western Reserve 1976; *professor, Anatomy, 1978 (1990)*

Sandrock, James P., B.A. Iowa 1951, M.A. 1958, Ph.D. 1961; *professor, German, 1960 (1977)*

Sankey, Richard R., B.S. Kansas State 1967, D.D.S. Iowa 1971; *adjunct associate professor, Family Dentistry, 1972 (1981)*

Sant, Rajiv, B.Tech. Indian Institute of Technology (New Delhi) 1975, Dipl. Indian Institute of Management (Ahmedabad) 1977, Ph.D. Pittsburgh 1987; *assistant professor, Finance, 1985 (1987)*

Santizo, Mario J., B.S. St. Louis 1964, M.A. 1966, Ph.D. 1975; *associate professor, Spanish and Portuguese, 1970 (1979)*

Sass, Stephen L., Dr.Pol. Budapest (Hungary) 1939, J.D. 1943, M.S.L.S. Western Reserve 1961; *professor emeritus, Law, 1964 (1986)*

Sasso, Gary M., B.S. Central Missouri State 1975, M.S. Kansas 1977, Ph.D. 1983; *associate professor, Curriculum and Instruction, 1985 (1988)*

Sato, Kenzo, M.D. Hokkaido (Japan) 1964, Ph.D. Tohoku (Japan) 1977; *professor, Dermatology, 1978 (1988)*

Sato, Yutaka, M.D. Nippon Medical School (Japan) 1973; *associate professor, Radiology, 1986 (1988)*

Saunders, Edward J., B.A. Villanova 1974, M.S.W. St. Louis 1979, M.P.H. Pittsburgh 1985, Ph.D. 1985; *assistant professor, School of Social Work, 1985*

Saur, John M., B.S. Iowa 1970; *adjunct instructor, Pharmacy, 1987*

Savin, Nathan Eugene, B.A. California (Berkeley) 1956, M.A. 1960, Ph.D. 1969; *professor, Economics, 1986*

Sayre, Robert F., B.A. Wesleyan 1955, M.A. Yale 1958, Ph.D. 1962; *professor, English, 1965 (1972)*

Sayrs, Lois W., B.A. South Carolina 1979, M.A. Northwestern 1981, Ph.D. 1984; *assistant professor, Political Science, 1987*

Scahill, Jeannette L., B.S. Central Methodist 1950, M.A. Wyoming 1955, Ph.D. Iowa 1963; *associate professor, Physical Education and Sports Studies/Curriculum and Instruction, 1965 (1970)*

Scamman, Franklin L., B.S. Kansas 1966, M.D. 1970; *associate professor, Anesthesia, 1978 (1984)*

Scandrett, Forrest R., D.D.S. Iowa 1965, M.S. Texas 1970; *professor, Prosthodontics, 1970 (1982)*

Scavo, Rebecca R., B.A. Buena Vista 1972, M.S.W. Iowa 1982; *adjunct assistant professor, School of Social Work, 1988*

Schaal, David, B.A. Geneva 1942, M.A. Western Reserve 1946, Ph.D. Illinois 1956; *professor emeritus, Theatre Arts, 1956 (1985)*

Schabilion, Jeffry T., B.S. Iowa State 1965, M.A. Kansas 1967, Ph.D. 1969; *professor, Botany, 1968 (1980)*

Schacht, Elizabeth A., B.S.N. Iowa 1972, M.A. Iowa 1978; *adjunct instructor, Nursing, 1979 (1985)*

Schaefer-Nelson, Teri, B.A. Iowa 1981, M.S.W. 1983; *adjunct instructor, School of Social Work, 1988*

Schauberger, Charles W., B.S. Iowa State 1974, M.D. Iowa 1978; *clinical instructor, Obstetrics and Gynecology, 1985*

Schedl, Harold P., B.S. Yale 1942, M.S. 1944, Ph.D. 1946, M.D. Iowa 1955; *professor, Internal Medicine, 1959 (1967)*

Schedl, Naomi M., B.F.A. Yale 1943, M.F.A. 1946; *professor emeritus, Home Economics, 1966 (1990)*

Scheffel, Annette L., B.S.N. Indiana 1964, M.S.N.Ed. 1965; *assistant professor, Nursing, 1965 (1968)*

Scheldrup, Eugene W., M.D. Iowa 1929; *professor emeritus, Anatomy, 1932 (1969)*

Schelper, Robert L., B.A. St. Mary's 1971, M.D. Texas (San Antonio) 1975, Ph.D. 1978; *associate professor, Pathology, 1982 (1987)*

Schepanski, Albert A., B.A. Saskatchewan (Canada) 1961, M.A. 1966, Ph.D. Illinois 1978; *associate professor, Accounting, 1978 (1984)*

Scherer, Ronald C., B.S. Kent State 1968, M.A. Indiana 1972, Ph.D. Iowa 1981; *adjunct associate professor, Speech Pathology and Audiology, 1983 (1988)*

Schlechte, Janet A., B.S. Nebraska 1967, M.A. California (Santa Barbara) 1969, M.D. Nebraska 1975; *associate professor, Internal Medicine, 1981 (1987)*

Schmid, Phillip G., B.A. Carleton 1957, M.D. Chicago 1961; *professor, Internal Medicine, 1968 (1975)*

Schmidt, Frank L., B.A. Bellarmine 1966, M.S. Purdue 1968, Ph.D. 1970; *Ralph L. Sheets professor, Management and Organizations, 1985*

Schmidt, Julius, B.F.A. Cranbrook Academy of Art 1953, M.F.A. 1955; *professor, School of Art and Art History, 1970 (1972)*

Schmidt, Thomas J., B.A. Delaware 1969, M.S. Cornell 1973, Ph.D. 1976; *associate professor, Physiology and Biophysics, 1983 (1989)*

Schnoor, Jerald L., B.S. Iowa State 1972, M.S. Texas 1974, Ph.D. 1975; *professor, Civil and Environmental Engineering, 1977 (1983)*

Schoderbek, Peter, B.A. Pennsylvania State 1954, M.S. 1959, Ph.D. Michigan 1964; *professor, Management and Organizations, 1964 (1971)*

Schoen, Harold L., B.S. Dayton 1963, M.S. Indiana 1966, M.S. Dayton 1969, Ph.D. Ohio State 1971; *professor, Curriculum and Instruction/Mathematics, 1974 (1978)*

Schoenbaum, David L., B.A. Wisconsin 1955, M.A. Wisconsin 1958, D.Phil. Oxford (England) 1965; *professor, History, 1967 (1971)*

Schoenwald, Ronald D., B.S. Arizona 1963, M.S. Purdue 1969, Ph.D. 1971; *professor, Pharmacy, 1978 (1986)*

Schoer, Lowell A., B.A. Iowa 1958, M.A. 1959, Ph.D. 1961; *professor, Psychological and Quantitative Foundations, 1961 (1967)*

Scholz, Paul D., B.S.M.E. Washington 1960, M.S.M.E. Northwestern 1965, Ph.D. 1967; *professor, Mechanical Engineering, 1967 (1979)*

Schrier, Leslie L., B.A. California State 1973, M.A. Drake 1979, Ph.D. Ohio State 1989; *assistant professor, Curriculum and Instruction/Spanish and Portuguese, 1989*

Schrimper, George D., B.S. Iowa 1964, M.A. 1965; *assistant professor, Museum of Natural History, 1966 (1973)*

Schrock, Christian E., B.A. Iowa 1941, M.D. 1944; *clinical associate professor, Internal Medicine, 1974*

Schroeder, Deborah M., B.S.N. Iowa 1973, M.A. 1975; *adjunct instructor, Nursing, 1976 (1982)*

Schrott, Helmut G., B.A. Western Reserve 1962, M.D. New York (Buffalo) 1966; *associate professor, Preventive Medicine and Environmental Health/Internal Medicine, 1973 (1979)*

Schuldes, Rudolf E., M.D. Basel (Switzerland) 1951; *clinical instructor, Obstetrics and Gynecology, 1982*

Schulein, Thomas M., B.S. Illinois 1968, D.D.S. 1970, M.S. 1982; *associate professor, Operative Dentistry, 1979 (1988)*

Schultz, Randall L., B.Sc. Ohio State 1965, M.B.A. Wayne 1967, Ph.D. Northwestern 1970; *professor, Marketing, 1988*

Schultz, Stephen W., B.F.A. San Francisco Art Institute 1971, M.F.A. Stanford 1974; *professor, School of Art and Art History, 1975 (1987)*

Schulz, Friedmar J., Dipl. Gottingen (Germany) 1977, Dr.rer.nat. 1979, Dr. habil 1985; *associate professor, Mathematics, 1985 (1986)*

Schulz, Rudolph W., B.S. Northwestern 1954, M.A. Stanford 1955, Ph.D. Northwestern 1958; *professor, Psychology, 1960 (1966)*

Schulze, John H., B.S.Ed. Kansas State Teachers 1940, M.F.A. Iowa 1948; *professor emeritus, School of Art and Art History, 1948 (1985)*

Schulze, Konrad S., B.S. Munich (Germany) 1965, M.D. Heidelberg (Germany) 1968; *associate professor, Internal Medicine, 1975 (1983)*

Schum, Robert L., B.S. Iowa 1972, M.A. Denver 1974, Ph.D. 1983; *adjunct assistant professor, Speech Pathology and Audiology, 1984*

Schumacher, Larry P., B.S.N. Southwest Missouri State 1983, M.S.N. Indiana 1985; *adjunct associate professor, Nursing, 1989*

Schurtz, Steven H., B.S. Iowa 1972, M.D. 1975; *clinical assistant professor, Urology, 1985*

Schut, Arthur J., B.A. Central 1969, M.S. University of Albany 1988; *adjunct instructor, Counselor Education, 1981*

Schwartz, Barbara A., B.A. Michigan 1967, M.A. 1968, J.D. Wayne State 1975; *clinical professor, Law, 1977 (1985)*

Schwartz, David A., B.A. Rochester 1975, M.D. San Diego 1979, M.P.H. Harvard 1985; *assistant professor, Internal Medicine, 1988*

Schweitzer, John W., A.B. Thomas More 1960, M.S. Cincinnati 1962, Ph.D. 1966; *professor, Physics and Astronomy, 1966 (1978)*

Schwert, Donald P., B.S. Allegheny 1972, M.S. Syracuse 1975, Ph.D. Waterloo (Canada) 1978; *adjunct assistant professor, Geology, 1985*

Schweser, G. Carl, B.S. Missouri School of Mines 1966, M.B.A. Missouri 1968, Ph.D. Georgia 1976, C.F.A. 1980; *associate professor, Finance, 1976 (1982)*

Sconing, James A., B.S. Pittsburgh 1979, M.S. Florida State 1981, Ph.D. 1985; *assistant professor, Statistics and Actuarial Science, 1985*

Scott, Gerald L., D.D.S. University of the Pacific 1967; *adjunct assistant professor, Endodontics, 1979 (1989)*

Scott, John Beldon, B.A. Indiana 1968, M.A. Rutgers 1975, Ph.D. 1982; *associate professor, School of Art and Art History, 1982 (1988)*

Scott, M. Gladys, B.A. DePauw 1927, M.A. Iowa 1931, Ph.D. 1937; *professor emeritus, Physical Education and Sports Studies, 1934 (1974)*

Scott, William E., B.A. Iowa 1959, M.S. 1962, M.D. 1964; *professor, Ophthalmology, 1971 (1979)*

Scott, William J., B.S. Rochester 1973, M.S. Wright State 1978, Ph.D. Cornell 1983; *assistant professor, Chemistry 1985*

Scriabine, Helene, M.A. Leningrad (U.S.S.R.) 1941, Ph.D. Syracuse 1962; *professor emeritus, Russian, 1960 (1974)*

Scullion, Rosemarie, B.A. Wisconsin (Madison) 1978, M.A. 1982, Ph.D. 1987; *assistant professor, French and Italian, 1987*

Scurletis, Theodore D., B.S. Pittsburgh 1947, M.D. 1951, M.Ph. North Carolina 1972; *professor emeritus, Pediatrics, 1975 (1989)*

Seabold, James E., B.S. Michigan State 1964, M.D. Michigan 1968; *associate professor, Radiology, 1982 (1985)*

Seaman, Walter I., B.A. Beloit 1976, Ph.D. Massachusetts 1982; *assistant professor, Mathematics, 1983*

Searle, Gordon W., B.S. Illinois 1941, M.D. 1945, M.S. Northwestern 1949, Ph.D. 1951; *associate professor emeritus, Physiology and Biophysics, 1952 (1985)*

Searls, James C., B.A. Cornell 1950, D.D.S. Iowa 1955, Ph.D. 1966; *assistant professor emeritus, Anatomy/Family Dentistry, 1964 (1989)*

Sedransk, Joseph, B.S. Pennsylvania 1958, Ph.D. Harvard 1964; *professor, Statistics and Actuarial Science, 1985*

See, William A., B.A. Coe 1978, M.D. Chicago 1982; *assistant professor, Urology, 1988 (1990)*

Seebohm, Paul M., B.A. Cincinnati 1938, M.D. 1941; *professor emeritus, Internal Medicine, 1949 (1986)*

Segaloff, Deborah L., B.S. Pennsylvania State 1976, Ph.D. Vanderbilt 1980; *assistant professor, Physiology and Biophysics, 1990*

Selim, Mustafa I., B.S. Cairo (Egypt) 1970, M.S. 1975, Ph.D. Mississippi 1981; *assistant professor, Preventive Medicine and Environmental Health, 1988*

Semken, Holmes A., Jr., B.S. Texas 1958, M.S. 1960, Ph.D. Michigan 1965; *professor, Geology, 1965 (1973)*

Seyfried, Dorothy M., B.S. Maryland 1955, M.S.W. Iowa 1977; *adjunct assistant professor, School of Social Work, 1987 (1989)*

Sgontz, Larry G., B.A. Wooster 1958, M.A. Illinois 1960, Ph.D. 1964; *professor, Economics, 1964 (1981)*

Shadur, Craig A., B.A. Northwestern 1970, M.D. Iowa 1974; *clinical assistant professor, Internal Medicine, 1981*

Shah, Rizwan Z., F.Sc. Government College for Women (Pakistan) 1960, M.B.B.S. Fatima Jinnah Medical (Pakistan) 1965; *clinical instructor, Pediatrics, 1977*

Shalla, Clayton L., D.D.S. Iowa 1961, M.S. 1969; *associate professor, Oral Pathology and Diagnosis, 1967 (1972)*

Shamma, Asad R., B.S. American University (Beirut) 1977, M.D. 1981; *assistant professor, Surgery, 1987 (1989)*

Shane, Peter N., A.B. Harvard 1974, J.D. Yale 1977; *professor, Law, 1981 (1985)*

Shannon, Lyle W., B.A. Cornell 1942, M.A. Washington 1947, Ph.D. 1951; *professor, Sociology, 1962*

Sharp, Jamie D., B.A. San Francisco State 1976, M.S. Iowa 1978; *adjunct associate professor, Preventive and Community Dentistry, 1978 (1989)*

Shasby, D. Michael, A.B. Duke 1967, M.D. 1973; *professor, Internal Medicine, 1982 (1989)*

Shaw, Robert D., B.S. Iowa 1971, M.D. 1975; *clinical assistant professor, Pediatrics, 1982*

Shea, Madeline, B.S. California Institute of Technology 1977, Ph.D. Johns Hopkins 1984; *assistant professor, Biochemistry, 1989*

Sheldon, Daniel S., B.S. Northern State 1960, M.S. 1961, Ph.D. Iowa 1973; *associate professor, Curriculum and Instruction, 1973 (1980)*

Shepardson, Richard D., B.A. Chico State 1960, M.A. San Jose State 1968, Ph.D. Texas 1972; *professor, Curriculum and Instruction, 1972 (1981)*

Sherburne, Alan R., B.A. Iowa 1962, M.D. 1965; *clinical assistant professor, Anesthesia, 1977*

Sherman, Arnold D., B.S. Maryland 1965, M.A. Hofstra 1967, Ph.D. Carleton (Canada) 1969; *adjunct associate professor, Psychiatry, 1988*

Shibata, Erwin F., B.S.E.E. Washington 1974, M.S.E. 1980, Ph.D. Texas-Medical Branch (Galveston) 1984; *assistant professor, Physiology and Biophysics, 1986*

Shih, Ming-Che, B.S. Tunghai (Taiwan) 1976, Ph.D. Iowa 1983; *assistant professor, Botany/Biology, 1988*

Shimosato, Shiro, B.S. Shinsu (Japan) 1951, M.D. 1955, Ph.D. Kunsei (Japan) 1962; *professor, Anesthesia, 1975*

Shirazi, Siroos S., P.C.B. Shiraz (Iran) 1959, M.D. 1965; *professor, Surgery, 1972 (1981)*

Shires, Thomas K., A.B. Colgate 1957, M.S. Oklahoma 1962, Ph.D. 1965; *professor, Pharmacology, 1972 (1981)*

Shivapour, Ezzatollah, M.D. Tabriz (Iran) 1972; *clinical assistant professor, Neurology, 1980 (1982)*

Shymansky, James A., B.S. Bloomsburg State 1965, M.S. Indiana State 1969, Ph.D. Florida State 1972; *professor, Curriculum and Instruction, 1973 (1980)*

Sickels, Hilda, B.A. Omaha 1962, M.A. Iowa 1964; *adjunct instructor, School of Social Work, 1989*

Siddiqui, Jaleel Y., M.B.B.S. Dow Medical (Pakistan) 1961; *clinical associate professor, Internal Medicine, 1976 (1983)*

Sidwell, Stephen B., B.B.A. Iowa 1966, M.A. 1968, M.D. 1976; *clinical assistant professor, Family Practice, 1982*

Siebert, Calvin D., B.A. Kansas 1958, M.A. 1960, Ph.D. California (Berkeley) 1966; *professor, Economics, 1965 (1975)*

Siemers, Ross F., B.A. St. John's 1978, M.D. Minnesota 1982; *assistant professor, Internal Medicine, 1988 (1989)*

Silbermann, Neil N., B.S. Yale 1970, M.D. Connecticut 1974; *clinical associate professor, Ophthalmology, 1983 (1985)*

Simms, John, B.M. Curtis Institute of Music 1947, M.F.A. Iowa 1950; *professor emeritus, School of Music, 1949 (1989)*

Simon, J. Richard, B.B.A. Wisconsin 1951, M.A. 1953, Ph.D. 1955; *professor, Psychology/ Industrial and Management Engineering, 1957 (1968)*

Simon, Jonathan K., A.B. Columbia 1964; M.A. Wisconsin 1965, Ph.D. 1969; *professor, Mathematics, 1969 (1980)*

Simpson, Roger B., B.A. Hanover 1947, M.Div. Pittsburgh Seminary 1950, M.A. Northwestern 1962, D.D. Eastern Nebraska Christian 1968; *associate professor emeritus, Preventive and Community Dentistry/Family Dentistry, 1975 (1985)*

Sines, Jacob O., B.A. Minnesota 1949, M.A. 1951, Ph.D. Michigan State 1955; *professor, Psychology, 1970*

Singh, Manmohan, M.D. Magadh (India) 1979; *clinical instructor, Psychiatry, 1987*

Sinicropi, Anthony V., B.A. St. Bonaventure 1956, M.I.L.R. Cornell 1958, Ph.D. Iowa 1968; *John F. Murray professor, Management and Organizations, 1968 (1973)*

Sippy, Francis H., B.S. Seattle 1949; *assistant professor emeritus, Oral Pathology and Diagnosis, 1967 (1987)*

Sisk, Theresa, B.G.S. Iowa 1978, M.S.W. 1985; *adjunct instructor, School of Social Work, 1989*

Sivitz, William I., B.S. Pittsburgh 1966, M.D. Hahnemann 1972; *assistant professor, Internal Medicine, 1987 (1989)*

Six, Erich W., M.A. Frankfurt (Germany) 1949, Ph.D. 1954; *professor, Microbiology, 1960 (1973)*

Sjolund, Richard D., B.S. Wisconsin 1963, Ph.D. California (Davis) 1968; *associate professor, Botany, 1968 (1972)*

Skaar, Laurel M., B.S.Ph. Iowa 1986, Pharm.D. 1988; *adjunct assistant professor, Pharmacy, 1990*

Skorton, David J., B.A. Northwestern 1970, M.D. 1974; *professor, Internal Medicine/Biomedical Engineering/ Electrical and Computer Engineering, 1980 (1988)*

Slatton, Yvonne L., B.S. Middle Tennessee State 1960, M.S. North Carolina 1965, Ph.D. Iowa 1970; *associate professor, Physical Education and Sports Studies, 1964 (1981)*

Slifer, Eleanor H., B.S. Temple 1923, M.S. Pennsylvania 1926, Ph.D. Pennsylvania State 1930; *professor emeritus, Biology, 1931 (1967)*

Slonneger, Kenneth R., B.S. Illinois 1964, M.S. 1966, M.S. Iowa 1984, Ph.D. Illinois 1971; *assistant professor, Computer Science, 1982 (1989)*

Small, Arnold M., Jr., B.A. San Diego State 1951, M.S. Wisconsin 1953, Ph.D. 1954; *professor, Speech Pathology and Audiology/Psychology, 1958 (1964)*

Small, Gary W., B.S. North Carolina 1979, Ph.D. Pennsylvania State 1984; *assistant professor, Chemistry, 1984*

Small, Susan W., B.S.N. Nursing 1973, M.A. 1976; *adjunct instructor, Nursing, 1982*

Smidt, Gary L., B.A. Kearney State 1959, Physical Therapy Certificate Iowa 1960, M.A. 1967, Ph.D. 1969; *professor, Physical Therapy, 1969 (1977)*

Smigielski, Patricia, B.S.N. Georgetown 1977, M.S. Wisconsin 1981; *adjunct instructor, Nursing, 1984*

Smirl, Arthur L., B.S. Lamar 1968, M.S.E. Michigan 1969, M.S. Arizona 1974, Ph.D. 1975; *professor, Laser Science and Engineering/ Electrical and Computer Engineering/Physics and Astronomy, 1988*

Smith, Afton, B.S. Columbia 1922, M.A. 1927; *assistant professor emeritus, Child Behavior and Development, 1933 (1954)*

Smith, Donald D., B.A. Syracuse 1955, M.A. Nebraska 1957, Ph.D. North Carolina 1964; *professor, School of Journalism and Mass Communication, 1980*

Smith, Edgar L., D.D.S. Iowa 1965; *adjunct associate professor, Preventive and Community Dentistry, 1976 (1983)*

Smith, Elaine M., B.A. Ohio State 1968, M.P.H. Michigan 1972, Ph.D. New York (Buffalo) 1977; *associate professor, Preventive Medicine and Environmental Health/Preventive and Community Dentistry, 1979 (1985)*

Smith, Ian Maclean, M.B.Ch.B. Glasgow (Scotland) 1944, M.D. 1957; *professor, Internal Medicine/Family Practice, 1955 (1965)*

Smith, Jeanne K., B.A. Iowa 1933, M.A. 1937; *associate professor emeritus, Otolaryngology-Head and Neck Surgery, 1953 (1978)*

Smith, Jeanne M., M.D. Toronto (Canada) 1942; *associate professor emeritus, Internal Medicine, 1955 (1988)*

Smith, Jeffery A., B.A. Wisconsin (Madison) 1973, M.S. Boston University 1974, Ph.D. Wisconsin 1984; *associate professor, School of Journalism and Mass Communication, 1983 (1989)*

Smith, Jeffrey J., B.A. St.Mary's (Minnesota) 1972, M.D. Mayo Medical 1976; *assistant professor, Pediatrics, 1989*

Smith, John L., B.A. Southwestern College 1970, M.D. Kansas 1974; *assistant professor, Surgery, 1988*

Smith, Lloyd L., B.A. State College of Iowa 1953, M.A. Iowa 1954, Ph.D. 1956; *professor, Curriculum and Instruction, 1956 (1965)*

Smith, Marianne, B.S.N. Iowa 1978, M.S. Colorado 1983; *adjunct instructor, Nursing, 1987*

Smith, Max L., D.D.S. Iowa 1946; *adjunct professor, Prosthodontics, 1975*

Smith, Ray V., D.D.S. Iowa 1914; *professor emeritus, Prosthodontics, 1918 (1959)*

Smith, Robert A., B.S. Northwestern 1968, Ph.D. Maryland 1973; *associate professor, Physics and Astronomy, 1989*

Smith, Robert E., B.S. Iowa State 1964, M.D. Iowa 1969; *clinical assistant professor, Psychiatry, 1975 (1983)*

Smith, Theodore F., B.S.M.E. Illinois 1963, M.S.M.E. 1965, Ph.D. 1972; *professor, Mechanical Engineering, 1971 (1981)*

Smith, Tony P., B.S. Lenoir Rhyne 1976, M.D. East Carolina 1981; *assistant professor, Radiology, 1987*

Smith, Wilbur L., B.A. S.U.N.Y. (Buffalo) 1965, M.D. 1969; *professor, Radiology/Pediatrics, 1980 (1982)*

Smola, Bonnie, B.S.N. Kansas 1964, M.S. Old Dominion 1973, Ph.D. Iowa State 1980, M.S.N. Minnesota 1985; *adjunct assistant professor, Nursing, 1986*

Snetselaar, Linda G., B.S. Iowa State 1972, M.S. Iowa 1975, Ph.D. 1983; *adjunct assistant professor, Preventive Medicine and Environmental Health, 1985*

Snider, Alvin, B.A. Toronto 1977, M.A. 1978, Ph.D. Chicago 1984; *assistant professor, English, 1986*

Snider, Bill Carl F., B.A. Wichita 1942, M.A. Iowa 1951, Ph.D. 1955; *professor, Psychological and Quantitative Foundations, 1956 (1974)*

Snider, Mildred, B.A. Iowa 1938, M.A. Smith 1946; *professor emeritus, School of Social Work, 1951 (1977)*

Snitzer, James G., B.A. California (Los Angeles) 1973, M.F.A. Art Institute of Chicago 1976; *associate professor, School of Art and Art History, 1976 (1982)*

Snow, Peter G., B.A. Texas Technological 1958, M.A. 1960, Ph.D. Virginia 1963; *professor, Political Science, 1962 (1970)*

Snyder, Jeanne M., B.S. Northwestern 1968, Ph.D. Pennsylvania State 1972; *associate professor, Anatomy, 1988*

Sobotka, Jenelle L., B.S.Ph. Iowa 1987, Pharm.D. 1989; *clinical assistant professor, Pharmacy, 1990*

Soderberg, Gary L., B.A. Augustana 1960, Physical Therapy Certificate Iowa 1961, M.A. 1962, Ph.D. Pennsylvania State 1971; *professor, Physical Therapy, 1972 (1986)*

Soffer, Edy E., B.S. Bologna (Italy) 1971, M.D. Technion (Israel) 1974; *assistant professor, Internal Medicine, 1983 (1989)*

Sokoll, Martin D., B.S. Steubenville 1954, M.D. Pittsburgh 1958; *professor, Anesthesia, 1963 (1973)*

Solbrig, Ingeborg H., B.A. California State (San Francisco) 1964, M.A. Stanford 1966, Ph.D. 1969; *professor, German, 1975 (1981)*

Soldofsky, Robert M., B.S.C. St. Louis 1942, M.A. Washington (St.Louis) 1948, Ph.D. 1954; *John F. Murray professor, Finance, 1954 (1963)*

Soll, David R., B.A. Wisconsin 1964, M.A. 1968, Ph.D. 1969; *Carver/Emil Witschi professor, Biology, 1972 (1982)*

Solomons, Gerald, M.D. Royal College of Physicians and Surgeons (Edinburgh) 1943, D.C.N. Royal College of Physicians and Surgeons (England) 1948; *professor emeritus, Pediatrics, 1962 (1985)*

Solomons, Hope, B.A. Clark 1952, A.M. Wellesley 1954, Ed.D. Boston 1957; *professor emeritus, Nursing, 1967 (1985)*

Soloski, John R., A.B. Boston College 1974, M.A. Iowa 1976, Ph.D. 1978; *associate professor, School of Journalism and Mass Communication, 1977 (1984)*

Solow, John L., B.A. Yale 1976, M.A. Stanford 1981, Ph.D. 1983; *associate professor, Economics, 1981 (1988)*

Solursh, Michael, B.A. California (Los Angeles) 1964, Ph.D. Washington 1969; *Carver/Harold W. Beams professor, Biology, 1969 (1979)*

Sonnesyn, Kathleen M., B.S.N. Minnesota 1963, M.S. North Dakota State 1980; *adjunct instructor, Nursing, 1989*

Soper, Robert T., A.B. Cornell (Iowa) 1949, M.D. Iowa 1952; *professor, Surgery, 1958 (1968)*

Sorofman, Bernard A., B.A. Nevada 1972, B.S. Oklahoma 1979, Ph.D. Minnesota 1984; *associate professor, Pharmacy, 1984 (1990)*

Spalding, James C., B.A. Illinois 1942, B.D. Hartford Theological Seminary 1945, Ph.D. Columbia 1950; *professor, School of Religion, 1956 (1968)*

Spalj, Nancy E., B.S.N. Iowa 1963, M.A. 1975; *adjunct instructor, Nursing, 1976 (1985)*

Spangler, Steven R., B.A. Iowa 1972, M.S. 1972, Ph.D. 1975; *professor, Physics and Astronomy, 1982 (1988)*

Spanheimer, Robert G., B.S. Creighton 1971, M.D. Nebraska (Omaha) 1975; *assistant professor, Internal Medicine, 1988*

Spaziani, Eugene, B.A. California (Los Angeles) 1952, M.A. 1954, Ph.D. 1958; *professor, Biology, 1959 (1968)*

Spear, William M., M.D.C.M. Queens (Canada) 1927; *professor emeritus, Internal Medicine, 1957 (1969)*

Spector, Arthur A., B.A. Pennsylvania 1956, M.D. 1960; *professor, Biochemistry/Internal Medicine, 1968 (1975)*

Spellman, George G., B.S. St. Ambrose 1940, M.D. Iowa 1943; *clinical associate professor, Internal Medicine, 1976*

Spiker, Charles C., B.A. San Francisco State 1948, M.A. Iowa 1949, Ph.D. 1951; *professor emeritus, Psychology, 1951 (1990)*

Spitzer, Alan B., B.A. Swarthmore 1948, M.A. Columbia 1949, Ph.D. 1955; *professor, History, 1957 (1963)*

Spivey, Gary R., B.S. Ohio State 1969, M.A. Pacific Lutheran 1977; *professor, Aerospace Military Studies, 1987*

Spivey, James D., D.D.S. Michigan 1987, M.S. Iowa 1990; *assistant professor, Periodontics, 1990*

Spratt, James L., A.B. Chicago 1953, Ph.D. 1957, M.D. 1961; *professor, Pharmacology, 1961 (1971)*

Spriestersbach, Duane C., B.Ed. Winona State Teachers 1939, M.A. Iowa 1940, Ph.D. 1948; *professor emeritus, Speech Pathology and Audiology/Otolaryngology-Head and Neck Surgery, 1948 (1957)*

Springer, Owen L., B.S. Indiana State 1949, M.Ed. Illinois 1953, Ed.D. Michigan State 1964; *associate professor emeritus, Planning, Policy and Leadership Studies, 1968 (1988)*

Squier, Christopher A., B.A. Cambridge (England) 1963, M.A. 1967, Ph.D. London Hospital Medical (England) 1967; *professor, Oral Pathology and Diagnosis, 1975 (1980)*

Squire, Larry J., B.S. St. Ambrose 1972, D.D.S. Iowa 1976; *adjunct associate professor, Family Dentistry, 1978 (1983)*

Squire, Peverill, A.B. California (Berkeley) 1977, M.A. 1978, Ph.D. 1986; *associate professor, Political Science, 1985 (1989)*

Srinivasan, Padmini, M.Sc. Birla Institute of Technology and Science (India) 1978, Ph.D. Syracuse 1985; *assistant professor, Library and Information Science/Management Sciences, 1989*

Stack, Erin E., B.F.A. Philadelphia College of Art 1982, M.F.A. Art Institute of Chicago 1986; *assistant professor, Art and Art History, 1989*

Stahly, Donald P., B.S. Ohio State 1959, M.S. 1961, Ph.D. Illinois 1964; *professor, Microbiology, 1966 (1979)*

Staley, John H., B.A. Cornell (Iowa) 1966, M.A. Iowa 1969, Ph.D. 1974; *adjunct assistant professor, Hospital and Health Administration, 1973 (1977)*

Staley, Robert N., B.S. Minnesota 1957, D.D.S. 1959, M.A. Chicago 1967, M.S. SUNY (Buffalo) 1970; *professor, Orthodontics, 1970 (1985)*

Stamler, Frederic W., B.A. Iowa 1939, M.D. 1943; *professor emeritus, Pathology, 1947 (1983)*

Stanford, William, B.S.Ph. Iowa 1952, M.D. 1956; *associate professor, Radiology, 1985 (1987)*

Staples, Lawrence F., B.S. New Hampshire 1949, M.S. 1950, M.D. Iowa 1956; *clinical associate professor, Internal Medicine, 1967 (1974)*

Stapleton, Jack T., B.A. Iowa 1977, M.D. Kansas 1980; *assistant professor, Internal Medicine, 1986 (1987)*

Starck, Kenneth, B.A. Wartburg 1956, M.A. Missouri 1960, Ph.D. Southern Illinois 1968; *professor, School of Journalism and Mass Communication, 1974 (1976)*

Stark, Herald, B.S.Ed. Nebraska State Teachers 1930, M.A. Iowa 1934; *professor emeritus, School of Music, 1934 (1976)*

Starkweather, Jerry L., B.S. Upper Iowa 1950, M.A. Iowa 1954; *adjunct assistant professor, Counselor Education, 1983*

Stauffer, George V., B.S. Pennsylvania State 1969, M.S. 1974, Ph.D. 1976; *professor, Microbiology, 1978 (1989)*

Stay, Barbara A., A.B. Vassar 1947, M.A. Radcliffe 1949, Ph.D. 1953; *professor, Biology, 1967 (1977)*

Stearns, Genevieve, B.S. Carleton 1912, M.S. Illinois 1920, Ph.D. Michigan 1928; *professor emeritus, Orthopaedic Surgery, 1920 (1958)*

Steele, Oliver, B.S. Auburn 1949, M.S. 1951, Ph.D. Virginia 1965; *professor, English, 1967 (1974)*

Steele, William J., B.A. Pennsylvania 1951, Ph.D. 1958; *professor, Pharmacology, 1967 (1974)*

Stegink, Lewis D., B.A. Hope 1958, M.S. Michigan 1961, Ph.D. 1963; *professor, Pediatrics/ Biochemistry, 1963 (1976)*

Stebbens, James A., B.S. Iowa State 1962, Ph.D. Iowa 1967; *professor, Pediatrics, 1967 (1984)*

Steinkraus, Lawrence W., B.A. Cornell 1978, M.D. Virginia 1982; *assistant professor, Family Practice, 1988*

Steinmuller, David, B.A. Swarthmore 1956, Ph.D. Pennsylvania 1961; *professor, Surgery, 1988*

Stellwagen, Earle C., B.S. Elmhurst 1955, M.S. Northwestern 1959, Ph.D. California (Berkeley) 1963; *professor, Biochemistry, 1964 (1973)*

Stensvaag, John-Mark, B.A. Augsburg 1969, J.D. Harvard 1974; *professor, Law, 1988*

Stephens, Ralph I., B.S. Illinois 1957, M.S. 1960, Ph.D. Wisconsin 1965; *professor, Mechanical Engineering/Civil and Environmental Engineering, 1965 (1972)*

Stern, David, B.A. Oxford 1979, M.A. Pittsburgh 1980, M.A. California (Berkeley) 1982, Ph.D. 1987; *assistant professor, Philosophy, 1988 (1989)*

Stern, Frederick, B.S. Michigan 1975, M.S. 1977, Ph.D. 1980; *associate professor, Mechanical Engineering, 1983 (1989)*

Stern, Gerald, B.A. Pittsburgh 1947, M.A. Columbia 1949; *professor, English, 1982*

Stevens, Harriet, B.A. Iowa 1932, M.S. 1934; *assistant professor emeritus, Home Economics, 1951 (1975)*

Stevenson, Calvin R., B.S., M.A. Columbia 1947, Ph.D. Iowa 1967; *adjunct assistant professor emeritus, Psychological and Quantitative Foundations, 1970 (1982)*

Stevenson, Richard A., B.B.A. St. Bonaventure 1961, M.B.A. Syracuse 1962, Ph.D. Michigan State 1965, C.F.A. 1973; *professor, Finance, 1967 (1976)*

Stewart, Mark A., B.A. Cambridge (England) 1953, M.D. St. Thomas Hospital Medical School (England) 1956; *Ida P. Haller professor, Psychiatry, 1972*

Stewart-Dedmon, Mary K., B.S.N. South Dakota 1959, M.A. Iowa 1976, Ph.D. 1982; *assistant professor, Nursing, 1974 (1983)*

Steyers, Curtis M., Jr., B.S. Bucknell 1971, M.D. Temple 1975; *associate professor, Orthopaedic Surgery, 1985 (1989)*

Stiles, James F., B.A. Iowa 1953, M.D. 1961; *clinical assistant professor, Family Practice, 1979 (1984)*

Stimson, James A., B.A. Minnesota 1966, Ph.D. North Carolina (Chapel Hill) 1970; *professor, Political Science, 1987*

Stinski, Mark F., B.A. Michigan State 1964, M.S. 1966, Ph.D. 1969; *professor, Microbiology, 1973 (1983)*

Stokes, John B., B.S. Gettysburg 1966, M.D. Temple 1971; *professor, Internal Medicine, 1978 (1986)*

Stoltzfus, Conrad M., B.A. Colorado 1966, Ph.D. Wisconsin 1971; *professor, Microbiology, 1979 (1985)*

Stolurow, Lawrence M., B.A. Minnesota 1940, M.A. Cornell 1946, Ph.D. Pittsburgh 1947; *professor emeritus, Psychological and Quantitative Foundations, 1977 (1989)*

Stone, Albert E., B.A. Yale 1949, M.A. Columbia 1955, Ph.D. Yale 1957; *professor, American Studies/English, 1977*

Stone, Gerald L., B.A. California (Los Angeles) 1963, B.D. Princeton Theological 1966, M.A. Michigan State 1970, Ph.D. 1972; *professor, Psychological and Quantitative Foundations, 1979 (1981)*

Stone, Mary S., B.S. Baylor 1978, M.D. 1981; *assistant professor, Dermatology, 1987*

Stoner, James W., B.S. Iowa State 1966, M.S. Iowa 1972, Ph.D. Northwestern 1977; *associate professor, Civil and Environmental Engineering/ Urban and Regional Planning, 1974 (1981)*

Story, Donna, B.S. Upper Iowa 1963, M.A. Northern Iowa 1972, Ph.D. Iowa State 1980, M.S.N. Minnesota 1985; *adjunct assistant professor, Nursing, 1986*

Strachota, Ellen M., B.S.N. Marquette 1967, M.A. Iowa 1979; *adjunct assistant professor, Nursing, 1982*

Strang, David, B.A. Harvard 1981, M.A. Stanford 1984, Ph.D. 1988; *assistant professor, Sociology, 1988*

Stratton, John R., B.A. Illinois 1957, M.A. 1959, Ph.D. 1963; *associate professor, Sociology, 1964 (1968)*

Stratton, Margaret M., B.A. Evergreen State 1977, M.A. New Mexico 1983, M.F.A. 1985; *assistant professor, School of Art and Art History, 1986*

Strauss, John S., B.S. Yale 1946, M.D. 1950; *professor, Dermatology, 1978*

Strauss, Ronald G., B.S. Capital 1961, M.D. Cincinnati 1965; *professor, Pathology/Pediatrics, 1976 (1980)*

Stroehmer, Gerhard O., Dipl. Gottingen 1976, Dr.rer.nat. 1978, Habilitation Institute of Technology (Aachen) 1984; *associate professor, Mathematics, 1986 (1988)*

Stromquist, H. Shelton, A.B. Yale 1966, M.A. Pittsburgh 1973, Ph.D. 1981; *associate professor, History, 1982 (1987)*

Strottmann, M. Paul, B.A. Iowa State Teachers 1951, M.D. Iowa 1958; *associate professor, Internal Medicine/Orthopaedic Surgery, 1962 (1975)*

Stroyan, K.D., B.S. Drexel Institute 1967, Ph.D. California Institute of Technology 1971; *professor, Mathematics, 1973 (1982)*

Strug, Robert A., D.D.S. Loyola 1971; *adjunct assistant professor, Prosthodontics, 1971 (1977)*

Strunk, William M. II, B.S. Bucknell 1969, D.D.S. Temple 1973; *adjunct assistant professor, Preventive and Community Dentistry, 1983*

Stryker, Robin, B.A. Smith 1975, M.S. Wisconsin (Madison) 1977, Ph.D. 1986; *assistant professor, Sociology, 1986*

Stuban, Steven M. F., B.S. U.S. Military Academy 1980, M.S.E.M. Missouri (Rolla) 1983; *assistant professor, Military Science, 1988*

Stubbs, David H., B.A. Westminster 1968, M.D. Missouri 1972; *clinical assistant professor, Surgery, 1987*

Stuit, Dewey B., B.S. Illinois 1931, M.S. 1932, Ph.D. 1934; *professor emeritus, Psychology, 1938 (1977)*

Sturdevant, Ray C., B.S. Illinois 1969, M.D. Loyola 1973; *clinical assistant professor, Pediatrics, 1979*

Stwalley, William C., B.S. California Institute of Technology 1964, Ph.D. Harvard 1969; *George Glockler professor, Chemistry/Physics and Astronomy, 1968 (1975)*

Subbiah, Bakkiam, M.B.B.S. Madras (India) 1972; *clinical assistant professor, Neurology, 1989*

Suchanek, Gerry L., Ph.D. Northwestern 1977, M.S. 1978; *associate professor, Finance, 1988*

Suda, Debra A., B.S. Iowa State 1978, M.D. Iowa 1981; *clinical instructor, Psychiatry, 1986*

Summers, Robert W., B.S. Michigan State 1961, M.D. Iowa 1965; *professor, Internal Medicine, 1970 (1983)*

Swaney, Robert L., A.B. Harvard 1953, M.D. Iowa 1962; *clinical assistant professor, Family Practice, 1979 (1984)*

Swanson, Elizabeth A., B.S.N. Iowa 1969, M.A. 1975, Ph.D. 1986; *associate professor, Nursing, 1974 (1981)*

Swanson, Jack T., B.A. Iowa 1966, M.D. 1970; *clinical assistant professor, Pediatrics, 1980*

Swayze, Victor W., II, B.S. Union (Nebraska) 1979, M.D. Loma Linda 1979; *assistant professor, Psychiatry, 1988 (1989)*

Swenson, Charles A., B.S. Gustavus Adolphus 1955, Ph.D. Iowa 1959; *professor, Biochemistry, 1960 (1972)*

Swett, Keene, B.S. Tufts 1955, M.S. Colorado 1961, Ph.D. Edinburgh (Scotland) 1965; *professor, Geology, 1966 (1974)*

Swift, Edward J., Jr., B.S. South Carolina 1976, D.M.D. Medical University of South Carolina 1979, M.S. Iowa 1989; *assistant professor, Operative Dentistry, 1986 (1989)*

Symreng, Tommy, M.D. Linkoping (Sweden) 1974, Ph.D, 1983; *associate professor, Anesthesia, 1990*

Syrop, Craig H., M.D. Virginia 1980; *assistant professor, Obstetrics and Gynecology, 1986*

Szertics, Joseph, Licenciate Madrid (Spain) 1957, Ph.D. 1962; *professor, Spanish and Portuguese, 1967 (1975)*

Tachau, Katherine H., B.A. Oberlin 1972, M.A. Wisconsin 1975, Ph.D. 1981; *associate professor, History, 1985 (1988)*

Taggart, Mary P., B.A. SUNY 1977, A.M. Brown 1980, Ph.D. 1984; *assistant professor, Hospital and Health Administration, 1987*

Talbott, Albert D., B.S. Iowa State 1958, M.A. Michigan State 1961, Ph.D. 1968; *professor, School of Journalism and Mass Communication, 1967 (1975)*

Talman, William T., B.A. Virginia Military Institute 1966, M.D. Virginia 1970; *professor, Neurology, 1983 (1990)*

Tamura, Robert F., S.B. William and Mary 1981, A.M. Chicago 1983, Ph.D. 1988; *assistant professor, Economics, 1988*

Tannous, Raymond, M.D. Faculty of Medicine and Pharmacy (France) 1971; *associate professor, Pediatrics, 1977 (1982)*

Tarbox, Mary P., B.S.N. Mt. Mercy 1974, M.S.N. Minnesota 1977, N.Ed.D. Columbia (New York) 1986; *adjunct assistant professor, Nursing, 1988*

Tardy, Dwight C., B.A. San Diego State 1962, Ph.D. Washington 1967; *professor, Chemistry, 1969 (1980)*

Teague, Michael L., B.A. Colorado State 1968, M.Ed. 1969, Ed.D. Northern Colorado 1976; *professor, Leisure Studies, 1975 (1988)*

Tearse, David S., B.S. Stanford 1979, M.D. Wisconsin (Madison) 1983; *assistant professor, Orthopaedic Surgery, 1989*

Tellis, Gerard J., B.Sc. Bombay (India) 1975, P.D.B.M. Xavier Institute (India) 1977, Ph.D. Michigan 1983; *associate professor, Marketing, 1983 (1988)*

Templin, Vicki L., B.A. Minnesota 1974, Ph.D. 1985; *assistant professor, Political Science, 1989*

tenBroeke, James E., B.A. Rice 1962, M.S. Baylor 1967, M.D. 1967; *clinical assistant professor, Dermatology, 1973*

Tephly, Thomas R., B.S. Connecticut 1957, Ph.D. Wisconsin 1962, M.D. Minnesota 1965; *professor, Pharmacology, 1971*

Teresi, Mary E., B.S. Minnesota 1983, Pharm.D. 1984; *assistant professor, Pharmacy, 1986*

ter Haar, John A. A., B.A. Iowa 1954, M.A. 1955, Ph.D. 1957; *professor, German, 1964 (1975)*

Terrill, Pamela A., B.A. Colorado 1976, B.S. St.Louis 1978, M.S. Arizona State 1981; *adjunct instructor, Nursing, 1985*

Tesdahl, Sue, B.A. Iowa 1966, M.S.W. 1970; *adjunct instructor, School of Social Work, 1987*

Tesdall, Donald J., D.V.M. Iowa State 1962, M.D. Iowa 1966; *clinical assistant professor, Family Practice, 1974*

Tessmer, Kathleen M., B.Ed. Wisconsin 1958, M.S. 1976, Ph.D. 1984; *assistant professor, School of Library and Information Science/Psychological and Quantitative Foundations, 1982 (1985)*

Thayer, David L., B.S. Lewis and Clark 1952, M.A. Iowa 1955, Ph.D. 1960; *professor, Theatre Arts, 1955 (1968)*

Thayer, Keith E., B.A. Cornell 1951, D.D.S. Iowa 1955, M.S. 1956; *professor, Prosthodontics, 1955 (1963)*

Theilen, Ernest O., B.A. Nebraska 1945, M.D. 1947; *professor, Internal Medicine, 1951 (1962)*

Theisen, Bonnie R., B.A. Iowa 1983, M.S.W. 1985; *adjunct assistant professor, School of Social Work, 1989*

Theisen, William M., B.A. Loras 1960, M.S.W. Washington (Missouri) 1968, Ph.D. 1972; *associate professor, School of Social Work, 1975*

Thelander, Kristin P., B.M. St. Olaf 1976, M.A. Minnesota 1978, D.M.A. Wisconsin (Madison) 1987; *associate professor, School of Music, 1989*

Thomas, Barbara S., B.S. Iowa State 1951, M.A. Iowa 1964, Ph.D. 1968; *professor, Nursing, 1971 (1980)*

Thomas, Carole L., B.S. Northern Illinois 1964, M.M. 1966, M.S. 1968; *associate professor, School of Music, 1970 (1977)*

Thomas, Claudia J., B.S. Iowa 1977, M.D. 1980; *clinical instructor, Psychiatry, 1985*

Thomas, Julianne H., B.S. George Washington 1967, M.D. Nebraska 1971; *clinical assistant professor, Pediatrics, 1976*

Thompson, Duane E., B.S. Iowa State 1953, M.S. 1954, Ph.D. Iowa 1969; *professor, Management and Organizations, 1969 (1987)*

Thompson, H. Stanley, B.A. Minnesota 1953, M.D. Minnesota 1961, M.S. Iowa 1966; *professor, Ophthalmology, 1967 (1976)*

Thomsen, Timothy A., B.A. Cornell (Iowa) 1970, M.D. Iowa 1974; *clinical assistant professor, Surgery, 1976 (1984)*

Thomson, Elizabeth J., B.S.N. Coe 1975, M.A. Iowa 1983; *adjunct assistant professor, Nursing, 1985*

Thomson, William W., B.A. North Carolina Wesleyan 1973; *adjunct instructor, Museum of Natural History, 1982 (1985)*

Thoreson, Joseph D., B.S. Iowa State 1965, M.D. Iowa 1969; *clinical assistant professor, Internal Medicine, 1978*

Thorne, Peter S., B.S. Wisconsin (Madison) 1978, M.S. 1980, Ph.D. 1984; *assistant professor, Preventive Medicine and Environmental Health, 1988*

Thostenson, Marvin S., B.A. Luther 1934, M.A. Iowa 1941, Ph.D. 1953; *professor emeritus, School of Music, 1954 (1982)*

Throckmorton, Tom D., A.B. Drake 1934, M.S. Northwestern 1935, M.D. 1937, M.S. Minnesota 1942; *clinical associate professor emeritus, Surgery, 1981 (1989)*

Throgmorton, James A., A.B. Notre Dame 1966, M.S. Louisville 1972, Ph.D. California (Los Angeles) 1983; *assistant professor, Urban and Regional Planning, 1986*

Timmerman, Dennis, B.A. Cornell College, M.S.W. Illinois (Chicago), M.P.A. Iowa State; *adjunct instructor, School of Social Work, 1989*

Tinker, John H., B.S. Cincinnati 1964, M.D. 1968; *professor, Anesthesia, 1983*

Tinsman, Margaret, B.A. Colorado 1958, M.S.W. 1974; *adjunct instructor, School of Social Work, 1984*

Tippe, Carol Sue, B.S.N. Iowa 1979, M.P.H. North Carolina (Chapel Hill) 1983; *adjunct instructor, Nursing, 1989*

Titze, Ingo R., B.S. Utah 1963, M.S.E.E. 1965, Ph.D. Brigham Young 1972; *professor, Speech Pathology and Audiology, 1979 (1984)*

Tobacman, Larry S., A.B. Brandeis 1972, M.D. Case Western Reserve 1976; *associate professor, Internal Medicine/Biochemistry, 1986 (1989)*

Toda, Yasuyuki, B.S.E. Osaka (Japan) 1979, M.S.E. 1981, Ph.D. 1984; *adjunct assistant professor, Mechanical Engineering, 1989*

Todd, Michael M., B.A. Chicago 1971, M.D. 1975; *professor, Anesthesia, 1986 (1990)*

Tomanek, Robert J., B.S. Omaha 1959, M.A. Iowa 1960, Ph.D. 1967; *professor, Anatomy, 1972 (1982)*

Tomasini, Wallace J., B.A. Michigan 1949, M.A. 1950, Ph.D. 1953; *professor, School of Art and Art History, 1957 (1964)*

Tomblin, J. Bruce, B.A. LaVerne 1966, M.A. Redlands 1967, Ph.D. Wisconsin 1970; *professor, Speech Pathology and Audiology, 1972 (1984)*

Tomkovicz, James J., B.A. Southern California 1973, J.D. California (Los Angeles) 1976; *professor, Law, 1982 (1986)*

Ton-That, Tuong, M.A. California (Irvine) 1971, Ph.D. 1974; *professor, Mathematics, 1975 (1983)*

Tormey, T. Nicholas, B.A. Loras 1961, M.A. St. Bernard Seminary 1964, Ph.D. Union Graduate School 1978; *adjunct assistant professor, School of Social Work, 1982 (1984)*

Torrens, Jeanne A., B.S.N. Iowa 1964, M.S. Syracuse 1980; *adjunct instructor, Nursing, 1985*

Torres, Alfonso, B.S. Sonora (Mexico) 1962, M.D. National University of Mexico 1968; *clinical assistant professor, Pediatrics, 1977*

Townsend, Michael, B.S. Iowa 1968, M.A. 1975; *adjunct instructor, School of Social Work, 1988*

Townsend, Orville H., B.S. Iowa 1967, M.A. 1970; *adjunct instructor, Counselor Education, 1976*

Trachsel, Mary C., B.A. Iowa 1975, M.A. Pennsylvania State 1980, Ph.D. Texas (Austin) 1987; *assistant professor, Rhetoric, 1989*

Tracy, Martin B., B.A. Murray State 1965, M.A. Illinois 1969, Ph.D. 1982; *associate professor, School of Social Work, 1982 (1987)*

Tracy, Patsy D., B.A. Murry State 1965, M.S.W. Illinois 1969; *adjunct assistant professor, School of Social Work, 1988*

Tracy, Roger D., B.A. Iowa 1967, M.S. 1969; *adjunct associate professor, Preventive Medicine and Environmental Health, 1973 (1981)*

Tranel, Daniel T., B.A. Notre Dame 1979, M.A. Iowa 1981, Ph.D. 1982; *associate professor, Neurology, 1986 (1990)*

Trank, Douglas M., B.A. Kearney State 1967, M.A. 1970, Ph.D. Utah 1973; *professor, Rhetoric/Curriculum and Instruction, 1974 (1987)*

Traynelis, Vincent C., B.A. West Virginia 1978, M.D. 1983; *assistant professor, Surgery, 1989*

Trigg, Michael E., B.A. Trinity (Connecticut) 1971, M.D. George Washington 1975; *professor, Pediatrics, 1986 (1990)*

Trimble, Richard B., B.A. Yale 1962, M.D. Baylor 1966; *clinical associate professor, Internal Medicine, 1977 (1986)*

Triolo, Pamela A., B.S. College of St. Teresa 1972, M.S.N. St.Louis 1975; *adjunct instructor, Nursing, 1983 (1988)*

Trummel, J. M., B.S. Illinois 1939, M.S. Iowa State 1940, Ph.D. Iowa 1960; *professor emeritus, Mechanical Engineering, 1941 (1986)*

Tsalikian, Eva, M.D. Athens (Greece) 1973; *associate professor, Pediatrics, 1983 (1987)*

Tubbs, Richard M., B.A. Kalamazoo 1971, M.A. Illinois State 1973, M.S. 1983, Ph.D. Florida 1988; *assistant professor, Accounting, 1988*

Tucker, Norval, B.F.A. Iowa 1951, M.F.A. 1955, Ph.D. 1958; *associate professor, School of Art and Art History, 1955 (1963)*

Tucker, Robert D., B.S. Nebraska 1969, Ph.D. Minnesota 1976, M.D. Nebraska 1978; *assistant professor, Pathology, 1983*

Turek, Lubomir P., M.D. Charles-Prague (Czechoslovakia) 1975; *associate professor, Pathology, 1982 (1988)*

Turner, Darwin T., B.A. Cincinnati 1947, Ph.D. Chicago 1956; *University of Iowa Foundation professor, English/African-American World Studies, 1971*

Turner, Deborah A., B.S. Iowa State 1973, M.D. Iowa 1978; *assistant professor, Obstetrics and Gynecology, 1986*

Turner, Thomas, B.A. Chicago 1935, M.A. 1936, Ph.D. Iowa 1942; *professor emeritus, School of Music, 1942 (1982)*

Tuttle, Sherwood D., B.S. New Hampshire 1939, M.S. Washington State 1941, M.A. Harvard 1953, Ph.D. 1953; *professor emeritus, Geology, 1952 (1988)*

Tye-Murray, Nancy, B.S. Texas Christian 1977, M.A. Iowa 1979, Ph.D. 1984; *adjunct assistant professor, Speech Pathology and Audiology, 1989*

Tyler, Richard S., B.Sc. Western Ontario 1974, M.Sc. 1975, Ph.D. Iowa 1978; *professor, Otolaryngology-Head and Neck Surgery/Speech Pathology and Audiology, 1981 (1987)*

Tyree, Ronald W., B.A. Iowa 1954, M.A. 1955, Ph.D. 1957; *professor, School of Music, 1965 (1979)*

Uhl, George J., B.S. Iowa State 1945, B.S. 1954; M.D. Iowa 1959; *clinical assistant professor, Family Practice/Oral Pathology and Diagnosis, 1973 (1977)*

Ungar, Steven R., B.A. Wisconsin 1966, M.A. 1968, Ph.D. Cornell 1973; *professor, French and Italian/Comparative Literature, 1976 (1985)*

Updegraf, Ruth, B.A. Vassar 1923, Ph.D. Iowa 1928; *professor emeritus, Child Behavior and Development, 1928 (1970)*

Urbanowski, Nancy, D.D.S. Iowa 1990; *adjunct instructor, Preventive and Community Dentistry, 1990*

Urdaneta, Luis F., Bach. San Bartolome (Colombia) 1953, M.D. National (Colombia) 1960; *professor, Surgery, 1979 (1988)*

Valentine, Richard L., B.S. Michigan 1973, M.S.Ch.E. 1974, M.S. California (Berkeley) 1977, Ph.D. 1982; *associate professor, Civil and Environmental Engineering, 1982 (1987)*

VanAernum, Carol, R.D.H. Iowa 1962; *adjunct assistant professor, Preventive and Community Dentistry, 1985*

Van Allen, James A., B.S. Iowa Wesleyan 1935, M.S. Iowa 1936, Ph.D. 1939, D.Sc. Iowa Wesleyan 1951, D.Sc. Grinnell 1957, D.Sc. Coe 1958, D.Sc. Cornell 1959, D.Sc. Dubuque 1960, D.Sc. Michigan 1961, D.Sc. Northwestern 1961, D.Sc. Illinois (Jacksonville) 1963, D.Sc. Butler 1966, D.Sc. Boston 1966, D.Sc. Southampton 1967, D.Sc. Augustana 1969, D.Sc. St. Ambrose 1982; *Carver professor emeritus, Physics and Astronomy, 1951 (1985)*

VanBramer, Edward, B.A. South Dakota 1962, B.S.M. 1963, M.D. Iowa 1965; *clinical instructor, Internal Medicine, 1988*

Van Demark, Duane R., B.A. Hiram 1958, M.A. Iowa 1962, Ph.D. 1962; *professor, Otolaryngology-Head and Neck Surgery/Speech Pathology and Audiology, 1965 (1975)*

Vandenberg, Byron F., B.A. Occidental 1975, M.D. Georgetown 1980; *assistant professor, Internal Medicine, 1988*

VandenBerg, Joan, B.A. Iowa 1982; *adjunct instructor, School of Social Work, 1988*

Vandervelde, Lea S., B.S. Wisconsin 1974, J.D. 1978; *professor, Law, 1978 (1985)*

Van Dyke, Don C., B.S. Villanova 1968, M.D. Pennsylvania State 1975; *assistant professor, Pediatrics, 1987*

Van Dyke, Lauren A., B.A. Morningside 1928, M.A. Missouri 1934, Ph.D. 1942; *professor emeritus, Curriculum and Instruction, 1941 (1974)*

Van Dyke, Vernon B., B.A. Manchester 1933, M.A. Chicago 1934, Ph.D. 1937; *Carver professor emeritus, Political Science, 1949 (1982)*

Vangelisti, Anita L., B.A. Washington 1983, M.A. 1985, Ph.D. Texas (Austin) 1989; *assistant professor, Communication Studies, 1989*

Van Gilder, John C., B.A. West Virginia 1957, B.S. 1959, M.D. Pittsburgh 1961; *professor, Surgery, 1976*

Van Hoesen, Gary W., B.A. California State 1965, M.S. Kansas State 1967, Ph.D. 1969; *professor, Anatomy/Neurology, 1978 (1982)*

Van Voorhis, Bradley J., B.S. Iowa State 1981, M.D. Iowa 1984; *assistant professor, Obstetrics and Gynecology, 1990*

Vaughan, Emmett J., B.A. Creighton 1960, M.A. Nebraska 1962, Ph.D. 1963; *professor, Finance, 1963 (1971)*

Vavroch, Mary W., B.S.N. Iowa 1969, M.A. 1976, J.D. 1981; *adjunct assistant professor, Nursing, 1981*

Vélez, Diana, B.A. City College of New York 1973, M.A. Columbia 1975, Ph.D. 1982; *associate professor, Spanish and Portuguese, 1981 (1987)*

Veng-Pedersen, Peter, Cand. Pharm. Copenhagen 1970, Ph.D. Sydney 1977; *associate professor, Pharmacy, 1984*

Venturino, Ezio G., M.Sc. Torino (Italy) 1977, M.Sc. SUNY (Stony Brook) 1981, Ph.D. 1984; *assistant professor, Mathematics, 1986 (1987)*

Verdolini-Marston, Katherine, B.A. Indiana 1975, M.A. 1982, Ph.D. Washington University 1990; *assistant professor, Speech Pathology and Audiology, 1990*

Vernon, David H., A.B. Harvard 1949, LL.B. 1952, LL.M. New York 1953, S.J.D. 1960; *Allan D. Vestal professor, Law, 1966*

Vestling, Carl S., B.A. Carleton 1934, Ph.D. Johns Hopkins 1938; *professor emeritus, Biochemistry, 1963 (1981)*

Vetter, Arthur F., B.A. Coe 1939, M.S. North Carolina State 1956; *professor emeritus, Chemical and Biochemical Engineering, 1962 (1987)*

Vickstrom, Douglas, B.A. Nebraska 1969, M.D. 1973; *clinical assistant professor, Internal Medicine, 1978*

Vigliotti, Antonio P. G., M.D. Rome (Italy) 1974; *assistant professor, Radiology, 1987*

Vincent, Steven D., B.A. McPherson (Kansas) 1976, D.D.S. Missouri 1981, M.S. Iowa 1984; B.A. Illinois (Chicago) 1978, M.Ed. 1979, Ph.D. Illinois (Urbana) 1987; *assistant professor, Psychological and Quantitative Foundations, 1987*

Viturawong, Vichit, M.D. Ramathibodi (Thailand) 1972; *clinical assistant professor, Internal Medicine, 1979*

Vlastos, Stephen G., A.B. Princeton 1966, Ph.D. California (Berkeley) 1977; *professor, History, 1976 (1989)*

Voots, Richard, B.S. New York 1944, Ph.D. Iowa 1955; *assistant professor emeritus, Otolaryngology-Head and Neck Surgery, 1955 (1989)*

Voxman, Himie, B.S.Ch.E. Iowa 1933, M.A. 1934; *professor emeritus, School of Music, 1936 (1980)*

Wachal, Robert S., B.A. Minnesota 1952, M.S. Wisconsin 1959; Ph.D. 1966; *professor, Linguistics, 1964 (1975)*

Wachtel, Ruth E., A.B. Cornell 1974, Ph.D. Duke 1980; *assistant professor, Anesthesia, 1988*

Wacker, David P., B.A. Northern Colorado 1975, M.A. Arizona State 1978, Ph.D. 1979; *associate professor, Pediatrics/Curriculum and Instruction, 1982 (1986)*

Wadle, Karen, B.S.N. Iowa 1965, M.A 1983; *adjunct assistant professor, Nursing, 1984 (1987)*

Wagener, Jeffrey S., M.D. Colorado 1975; *associate professor, Pediatrics, 1983 (1988)*

Wakefield, Douglas S., B.A. SUNY at Buffalo 1973, M.O.T. Texas Women's University 1976, M.A. Iowa 1980, Ph.D. 1982; *assistant professor, Hospital and Health Administration, 1988*

Walder, Joseph A., B.S. Northwestern 1973, M.D. 1975, Ph.D. 1978; *professor, Biochemistry, 1978 (1988)*

Waldschmidt, Thomas J., B.S. Marquette 1977, Ph.D. Texas (Dallas) 1984; *assistant professor, Pathology, 1988*

Walker, Donald H., Jr., A.B. Carleton 1954, M.A. Indiana 1959, Ph.D. Pennsylvania 1966; *associate professor, Microbiology, 1970 (1976)*

Walker, George W., B.A. Michigan State 1950, M.A. 1964, M.F.A. 1965; *professor, School of Art and Art History, 1966 (1988)*

Walker, Henry A., B.A. Missouri (Kansas City) 1971, M.A. 1974; Ph.D. Stanford 1979; *associate professor, Sociology, 1988*

Walker, Jerry D., B.A. Iowa 1958, D.D.S. 1962, M.A. 1969; *professor, Pediatric Dentistry, 1968 (1984)*

Wallace, Nancy S., B.A. Graceland 1974, M.S.W. Iowa 1980; *adjunct assistant professor, School of Social Work, 1987*

Wallace, Peter D., A.B. Grinnell 1965, M.D. Iowa 1969; *clinical associate professor, Pediatrics, 1974 (1989)*

Wallace, Robert B., B.S.M. Northwestern 1964, M.D. 1967, M.Sc. New York (Buffalo) 1972; *professor, Preventive Medicine and Environmental Health/Internal Medicine, 1972 (1979)*

Walton, Richard E., B.A. Washington 1961, D.M.D. Oregon 1965, M.S. Illinois 1970; *professor, Endodontics, 1983*

Walz, Thomas H., B.A. St. Johns 1954, M.S.W. St. Louis 1958, Ph.D. Minnesota 1966; *professor, School of Social Work, 1973*

Wang, Wei-Yeh, B.S. National Taiwan 1966, Ph.D. Missouri 1972; *professor, Botany, 1975 (1987)*

Ward, Larry D., B.S. Kansas 1966, J.D. 1969; *Aliber professor, Law, 1972 (1978)*

Warden, David H., B.A. Westminster 1976, M.D. Missouri (Columbia) 1981, Ph.D. 1982; *assistant professor, Internal Medicine, 1988 (1989)*

Warner, David S., B.A. Wisconsin 1976, M.D. 1980; *associate professor, Anesthesia, 1985 (1989)*

Wasiljew, Bohdan K., B.S. DePaul 1972, M.D. Northwestern 1976; *clinical assistant professor, Surgery, 1990*

Wasserman, Edward A., B.A. California (Los Angeles) 1968, Ph.D. Indiana 1972; *professor, Psychology, 1972 (1983)*

Watson, Carol A., B.S.N. Iowa 1970, M.A. 1973, Ph.D. 1979; *adjunct associate professor, Nursing, 1972 (1988)*

Watson, Jerry J., B.S. West Texas State 1962, M.A. Michigan State 1971, Ph.D. 1974; *associate professor, Curriculum and Instruction, 1977 (1982)*

Watz, John A., B.S. West Point 1979, M.S. Troy State 1982; *assistant professor, Military Science, 1988*

Waziri, Rafiq, B.S. American (Lebanon) 1956, M.D. 1960; *associate professor, Psychiatry, 1966 (1971)*

Weaver, Mary Lee, B.S.N. Grandview (Des Moines) 1980, M.S.N. Minnesota 1984; *adjunct assistant professor, Nursing, 1989*

Weber, Harry B., A.B. Princeton 1950, M.A. Indiana 1958, Ph.D. 1969; *professor, Russian, 1966 (1984)*

Weeks, Daniel L., B.S. Purdue 1976, Ph.D. 1983; *assistant professor, Biochemistry, 1987*

Weems, Robert E., B.A. Western Illinois 1973, M.A. Boston 1975, M.A. Wisconsin (Milwaukee) 1982, Ph.D. Wisconsin (Madison) 1987; *assistant professor, History/African-American World Studies, 1988 (1989)*

Wefel, James S., B.S. Valparaiso 1968, Ph.D. State University of New York (Buffalo) 1973; *professor, Pediatric Dentistry, 1977 (1986)*

Wegrzynowicz, Edward S., B.A. St. Thomas 1976, M.D. Minnesota 1980; *assistant professor, Anesthesia, 1983 (1984)*

Wehage, Roger A., B.S. Iowa State 1967, M.S. 1977, M.S. Iowa 1979, Ph.D. 1980; *adjunct assistant professor, Mechanical Engineering, 1980 (1982)*

Weiger, Mark O., B.M. New England Conservatory 1982, M.M. Juilliard 1986; *assistant professor, School of Music, 1988 (1989)*

Weiland, Duane, B.A. Loras 1958, Ph.D. St. Thomas (Rome) 1964, M.S.W. Iowa; *adjunct instructor, School of Social Work, 1982*

Weiler, John M., B.S. Michigan 1967, M.D. Temple 1971; *associate professor, Internal Medicine, 1977 (1983)*

Weiler, Kay B., B.S. Indiana 1972, J.D. Iowa 1985, M.A. 1986; *assistant professor, Nursing, 1982 (1986)*

Weinberger, Miles, A.B. Pittsburgh 1960, M.D. 1965; *professor, Pediatrics, 1975 (1980)*

Weiner, Carl P., B.A. Lehigh 1972, M.D. Medical College of Georgia 1977; *professor, Obstetrics and Gynecology, 1983 (1990)*

Weiner, George J., B.A. Johns Hopkins 1978, M.D. Ohio State 1981; *assistant professor, Internal Medicine, 1989*

Weingeist, Thomas A., B.A. Earlham 1963, Ph.D. Columbia 1969, M.D. Iowa 1972; *professor, Ophthalmology, 1975 (1983)*

Weinstein, James N., B.S. Bradley 1972, D.O. Chicago Osteopathic College 1977; *associate professor, Orthopaedic Surgery/Biomedical Engineering, 1983 (1987)*

Weinstein, Stuart L., B.A. Illinois 1968, M.D. Iowa 1972; *Ignacio V. Ponseti professor, Orthopaedic Surgery, 1976 (1984)*

Weinstock, Joel V., B.S. Michigan 1969, M.D. Wayne State 1973; *associate professor, Internal Medicine, 1986*

Weir, Robert F., B.A. McMurry 1965, B.D. Emory 1968, M.A. Princeton 1970, Ph.D. 1972; *professor, Pediatrics, 1988*

Weirich, Frank H., B.Sc. Toronto (Canada) 1973, M.Sc. McMaster 1979, Ph.D. Toronto 1982; *associate professor, Geography/Civil and Environmental Engineering, 1988*

Weiser, Margaret G., B.S. Rutgers 1943, M.S. Florida State 1959, Ed.D. Illinois 1966; *professor, Curriculum and Instruction, 1966 (1983)*

Weismann, Douglas N., A.B. Occidental 1968, M.D. Arizona 1972, M.S. Iowa 1977; *associate professor, Pediatrics, 1977 (1984)*

Weiss, Amy L., B.A. State University of New York (Buffalo) 1974, M.A. Illinois 1976, Ph.D. Purdue 1983; *assistant professor, Speech Pathology and Audiology, 1987*

Weiss, Doyle L., B.S. Kansas 1957, M.S. Carnegie Mellon 1960, Ph.D. 1965; *John F. Murray professor, Marketing, 1987*

Weissbort, Daniel, B.A. Cambridge (England) 1956, M.A. 1981; *professor, English/Comparative Literature, 1974 (1985)*

Welch, Myron D., B.M. Michigan State 1965, M.M. 1966, Ed.D. Illinois 1973; *professor, School of Music, 1980 (1984)*

Wells, John G., B.A. Iowa 1957, D.D.S. 1960; *adjunct assistant professor, Prosthodontics, 1986*

Welsh, Michael J., B.S. Iowa 1970, M.D. 1974; *professor, Internal Medicine/Physiology and Biophysics, 1981 (1987)*

Wen, B-Chen, M.D. Kaoshiung 1979; *assistant professor, Radiology, 1986*

Wendler, Arthur J., B.E. Wisconsin State Teachers (LaCrosse) 1929, M.A. Iowa 1932, Ph.D. 1939; *associate professor emeritus, Exercise Science, 1937 (1972)*

Wendt, Charles G., B.S.M. Juilliard 1960, M.M. Indiana 1962; *professor, School of Music, 1966 (1980)*

Wenger, Jan C., B.S.Ph. South Dakota 1960, M.S. Minnesota 1966; *adjunct assistant professor, Pharmacy, 1976*

Wenstrom, Katharine D., B.A. Case Western Reserve 1976, M.A. Columbia 1979, M.D. Case Western Reserve 1983; *assistant professor, Obstetrics and Gynecology, 1990*

Wenzel, Richard P., B.S. Haverford 1961, M.D. Jefferson Medical 1965; *professor, Internal Medicine/Preventive Medicine and Environmental Health, 1986*

Wernimont, Ted, B.S. Iowa 1969, M.S.W. 1973; *adjunct instructor, School of Social Work, 1980*

Wertz, Christopher A., B.A. Columbia 1963, M.A. Michigan 1969, Ph.D. 1971; *associate professor, Russian, 1977 (1980)*

Wertz, Philip W., A.B. Rutgers 1971, Ph.D. Wisconsin (Madison) 1976; *associate professor, Oral Pathology and Diagnosis, 1990*

Wesner, Robert B., B.S. Iowa State 1979, M.D. Illinois 1983; *assistant professor, Psychiatry, 1987 (1988)*

West, James R., B.A. Wichita State 1971, Ph.D. California (Irvine) 1975; *professor, Anatomy, 1976 (1988)*

West, Jude P., B.A. St. Mary of the Lake 1953, M.B.A. Chicago 1961, Ph.D. Iowa 1969; *associate professor, Management and Organizations, 1969*

Weston, Burns H., B.A. Oberlin 1956, LL.B. Yale 1961, J.S.D. 1970; *Bessie Dutton Murray professor, Law, 1966 (1969)*

Wetlaufer, Gerald B., A.B. Princeton 1967, J.D. Yale 1972; *associate professor, Law, 1985*

Wetrich, David W., B.A. Iowa 1957, M.D. 1960; *clinical professor, Obstetrics and Gynecology, 1971 (1984)*

Wheeler, James J., D.D.S. Minnesota 1972, M.S. Missouri (Kansas City) 1981; *assistant professor, Oral and Maxillofacial Surgery, 1990*

Whelan, Mary K., B.A. Bryn Mawr 1977, M.A. Minnesota 1981, Ph.D. 1987; *assistant professor, Anthropology, 1987*

Wherritt, Irene M., B.A. California (Berkeley) 1965, M.A. Arizona 1969, Ph.D. New Mexico 1977; *associate professor, Spanish and Portuguese, 1980 (1984)*

Whitaker, Duane C., B.A. Iowa 1969, M.D. Arizona 1979; *associate professor, Dermatology, 1983 (1988)*

White, Jeanne L., B.A. Texas 1971, M.S.W. Iowa 1981; *adjunct instructor, School of Social Work, 1989*

Whitehead, F. Eugenia, B.S.H.E. Georgia 1936, M.S.Ed. 1942, D.Sc. Harvard 1951; *professor emeritus, Home Economics, 1955 (1978)*

Whiteman, Charles H., B.A. Kansas 1975, Ph.D. Minnesota 1981; *associate professor, Economics, 1980 (1986)*

Wick, James H., D.D.S. Iowa 1918; *professor emeritus, Operative Dentistry, 1924 (1964)*

Wicklund, Gary A., B.S. Iowa State 1963, M.B.A. Denver 1965, Ph.D. Northwestern 1971; *adjunct professor, Management Sciences, 1967 (1988)*

Widiss, Alan I., B.S. Southern California 1960, LL.B. 1963, LL.M. Harvard 1964; *Josephine R. Witte professor, Law, 1965 (1969)*

Widmer, Reuben B., B.A. Goshen 1940, M.D. Iowa 1943; *professor emeritus, Family Practice, 1971 (1985)*

Widness, John A., B.A. Amherst 1968, M.D. Duke 1972; *associate professor, Pediatrics, 1988*

Wieland, Veronica E., B.S.N. North Dakota 1969, M.A. Iowa 1971; *adjunct instructor, Nursing, 1981*

Wiemer, David F., B.S. Marquette 1972, Ph.D. Illinois 1976; *professor, Chemistry, 1978 (1989)*

Wieting, Stephen G., B.A. Whitworth 1962, B.D. Princeton Theological Seminary 1965, Ph.D. Minnesota 1971; *associate professor, Sociology, 1971 (1977)*

Wilcox, Jonathan, B.A. Manchester (England) 1981, Ph.D. Cambridge (England) 1987; *assistant professor, English, 1987*

Wilcox, Lisa R., B.A. Iowa 1972, M.A. 1973, D.D.S. 1983, M.S. 1986; *associate professor, Endodontics, 1986 (1990)*

Wilde, James G., M.D. Iowa 1975; *clinical instructor, Internal Medicine, 1988*

Wiley, Robert A., B.S. Michigan 1955, Ph.D. California (San Francisco) 1962; *professor, Pharmacy, 1984*

Willard, Derek H., B.A. Rhode Island 1964, M.A.C. Pennsylvania 1968, Ph.D. Iowa 1975; *associate professor, Preventive and Community Dentistry, 1974 (1981)*

Williams, Bonnie, B.A. Coe 1974, M.S.W. Iowa 1980, Ph.D. 1983; *adjunct assistant professor, School of Social Work, 1987*

Williams, Chad L., B.A. Wabash 1964, M.D. Iowa 1968; *clinical associate professor, Internal Medicine, 1973 (1983)*

Williams, Dean E., B.A. Iowa 1947, M.A. 1949, Ph.D. 1952; *professor emeritus, Speech Pathology and Audiology, 1958 (1987)*

Williams, Emma J., B.A. Simpson 1943, M.A. Iowa 1959; *assistant professor emeritus, School of Social Work, 1966 (1985)*

Williams, Glenys O., B.Sc. Wales 1950, M.B.B.Ch. Welsh National School of Medicine (Wales) 1953; *professor, Family Practice, 1974 (1989)*

Williams, Gregory H., B.A. Ball State, M.A. Maryland 1969, J.D. George Washington 1971, M.Phil. 1977, Ph.D. 1982; *professor, Law, 1977 (1983)*

Williams, Janet K., B.S.N. Iowa 1968, M.A. 1972, Ph.D. 1989; *assistant professor, Nursing, 1969 (1990)*

Williams, Norman E., B.A. Youngstown 1952, M.S. Brown 1954, Ph.D. California (Los Angeles) 1958; *professor, Biology, 1957 (1967)*

Williams, Richard D., B.S. Abilene Christian 1966, M.D. Kansas 1970; *professor, Urology, 1984*

Williams, Terence H., M.D. Manchester (England) 1953, Ph.D. Wales 1960; *professor, Anatomy, 1973*

Williams, Thomas P., D.D.S. Illinois 1968; *adjunct associate professor, Oral Pathology and Diagnosis, 1984 (1985)*

Williams, Vincent D., D.D.S. Iowa 1957, M.S. 1980; *associate professor, Family Dentistry, 1972 (1985)*

Williamson, Harold E., B.S. Wisconsin 1953, Ph.D. 1959; *professor, Pharmacology, 1960 (1970)*

Williamson, Roger A., B.S. Colorado State 1966, M.S. Baylor 1971, M.D. 1971; *professor, Obstetrics and Gynecology, 1981 (1990)*

Wilson, John T., B.A. Northern Colorado 1959, M.A. 1962, Ph.D. Florida 1973; *associate professor, Curriculum and Instruction, 1973 (1977)*

Wilson, Mary E., B.A. Carleton 1975, M.D. Rochester 1980; *assistant professor, Internal Medicine, 1986 (1987)*

Winfield, Howard N., B.A. Colgate 1973, M.D.C.M. McGill (Canada) 1978; *assistant professor, Urology, 1988*

Wing, Adrien K., A.B. Princeton 1978, M.A. California (Los Angeles) 1979, J.D. Stanford 1982; *associate professor, Law, 1987*

Winga, Edward R., B.A. Iowa 1958, M.D. 1962; *clinical instructor, Internal Medicine, 1988*

Winnie, John R., B.A. Cornell 1936, M.F.A. Iowa 1941; *associate professor emeritus, Communication Studies, 1950 (1981)*

Winniford, Michael D., B.S. Texas (Austin) 1973, M.D. Texas (Dallas) 1977; *associate professor, Internal Medicine, 1986 (1988)*

Winokur, George, A.B. Johns Hopkins 1944, M.D. Maryland 1947; *Penningroth professor, Psychiatry, 1971*

Wintermeyer, Laverne, M.A. Iowa 1948, M.D. 1961; *clinical associate professor, Pediatrics/Preventive Medicine and Environmental Health, 1971 (1981)*

Witte, David L., B.A. St. Olaf 1965, Ph.D. Iowa State 1971, M.D. Iowa 1982; *clinical assistant professor, Pathology, 1973 (1988)*

Witzke, Brian J., B.A. Wisconsin 1974, M.S. Iowa 1976, Ph.D. 1981; *adjunct assistant professor, Geology, 1982*

Woerner, Robert F., B.A. Louisville 1950, Ph.D. Indiana 1962; *associate professor emeritus, English, 1957 (1989)*

Wold, Marc S., B.S. California Institute of Technology 1979, Ph.D. Johns Hopkins 1984; *assistant professor, Biochemistry, 1989*

Wolf, Margery, *professor, Anthropology/Women's Studies, 1985*

Wolfson, Sara C., B.S. Appalachian State 1957, M.S. North Carolina 1962, Ed.D. Houston 1971; *associate professor, Home Economics/ Curriculum and Instruction, 1971 (1977)*

Wolfson, Sherwood, B.S. Westminister 1953, D.D.S. Pittsburgh 1957; *associate professor, Oral and Maxillofacial Surgery, 1971 (1976)*

Woodard, Fredrick, B.A. Iowa Wesleyan 1961, M.A. Iowa 1971, Ph.D. 1976; *associate professor, English/African-American World Studies, 1973 (1979)*

Woodhead, Jerold C., B.A. Stanford 1967, M.D. Yale 1971; *associate professor, Pediatrics, 1979 (1988)*

Woodhouse, Raymond D., B.A. Iowa 1961, D.D.S. Iowa 1961; *adjunct assistant professor, Preventive and Community Dentistry, 1981*

Woodward, Jean M. B., B.S.Ph. Rhode Island 1979, M.S. Purdue 1982, Ph.D. Texas-Austin 1985; *assistant professor, Pharmacy, 1988*

Woodworth, George, B.A. Carleton 1962, Ph.D. Minnesota 1966; *associate professor, Statistics and Actuarial Science, 1971*

Woolson, Robert F., B.A. Delaware 1967, Ph.D. North Carolina 1972; *professor, Preventive Medicine and Environmental Health/Statistics and Actuarial Science, 1972 (1981)*

Worick, Diane E., B.A. Cornell (Iowa) 1972, M.S.W. Iowa 1973; *adjunct instructor, School of Social Work, 1984*

Wright, John R., B.S. Northern Illinois 1976, M.S. 1979, M.A. Rochester 1981, Ph.D. 1983; *associate professor, Political Science, 1983 (1988)*

Wu, Chun-Fang, B.S. Tunghai (Taiwan) 1969, Ph.D. Purdue 1976; *professor, Biology, 1979 (1989)*

Wu, Han-Chin, B.S. National Taiwan 1960, M.S. Rhode Island 1965, M.S. Yale 1967, Ph.D. 1970; *professor, Civil and Environmental Engineering/ Mechanical Engineering, 1970 (1981)*

Wu, Jiing-Kae, B.S. National Taiwan College 1977, M.S. Florida 1982, Ph.D. 1985; *assistant professor, Mechanical Engineering, 1987*

Wu, Shih-Yen, B.A. Oberlin 1954, Ph.D. Northwestern 1960; *professor, Economics, 1964 (1968)*

Wulfekuhler, Warren V., B.A. Tulane 1952, M.D. 1956; *clinical associate professor, Urology, 1978*

Wulff, Dan, B.S. Iowa State 1974, M.S.W. Iowa 1976; *adjunct instructor, School of Social Work, 1982*

Wunder, Charles C., A.B. Washington and Jefferson 1949, M.S. Pittsburgh 1952, Ph.D. 1954; *professor, Physiology and Biophysics, 1954 (1971)*

Wurster, Dale E., B.S. Wisconsin 1942, Ph.D. 1947; *professor emeritus, Pharmacy, 1972 (1985)*

Wurster, Dale Eric, B.S. Wisconsin 1974, Ph.D. Purdue 1979; *associate professor, Pharmacy, 1982 (1987)*

Xakellis, George C., Jr., B.A. Franklin and Marshall College 1977, M.D. Pittsburgh 1981; *assistant professor, Family Practice, 1987*

Yae, K. Harold, B.S. Seoul National (Korea) 1980; B.S. SUNY at Buffalo 1983, Ph.D. 1987; *assistant professor, Mechanical Engineering, 1987*

Yager, Robert E., B.A. Iowa State Teachers 1950, M.S. Iowa 1953, Ph.D. 1957; *professor, Curriculum and Instruction, 1956 (1967)*

Yamada, Thoru, M.D. Nagoya (Japan) 1966; *professor, Neurology, 1975 (1984)*

Yans, Javad, M.D. Tabriz Medical School (Iran) 1965; *clinical associate professor, Internal Medicine, 1973 (1983)*

Yarbrough, Donald B., B.A. Hendrix 1971, M.A. Kentucky 1973, Ph.D. Georgia 1982; *assistant professor, Psychological and Quantitative Foundations, 1982*

Yates, William R., B.A. Blair 1974, M.D. Nebraska 1977; *assistant professor, Psychiatry, 1986*

Yeaney, Darrell W., M.S. Kansas State 1968, A.B. Westminster 1953, Ph.D. Boston 1975; *adjunct assistant professor, Preventive and Community Dentistry, 1987 (1989)*

Yeats, Robert E., B.S. Ithaca 1966, M.A. Iowa 1971, M.F.A. 1977; *associate professor, School of Music, 1973 (1981)*

Yerington, Kenneth H., B.S.C. Iowa 1958; *adjunct assistant professor, Hospital and Health Administration, 1977*

Yorek, Mark A., B.S. Bemidji 1976, Ph.D. North Dakota 1981; *adjunct assistant professor, Internal Medicine, 1987*

Yossi, Dennis, D.D.S. Iowa 1978; *adjunct assistant professor, Preventive and Community Dentistry, 1983*

Young, Eugene W., B.S. Drake 1954, D.D.S. Iowa 1962; *clinical associate professor, Preventive and Community Dentistry, 1975 (1983)*

Young, Mark Alan, A.B. Princeton 1979, Ph.D. California (Berkeley) 1987; *assistant professor, Center for Laser Science and Engineering, 1990*

Young, Philip E., B.A. Drake 1978, D.D.S. Iowa 1979; *adjunct assistant professor, Preventive and Community Dentistry, 1986*

Young, Richard A., B.A. Rutgers 1978, M.B.A. 1979, Ph.D. Ohio State 1984; *assistant professor, Accounting, 1987*

Yuh, William T. C., B.S. Chio-Tung (Taiwan) 1971, M.S. Auburn 1974, M.D. Alabama 1980; *assistant professor, Radiology, 1987*

Zaback, Alan, B.A. SUNY-Albany 1973, M.S. Iowa 1976; *adjunct instructor, School of Social Work, 1987*

Zach, Gene A., D.D.S. Iowa 1962, M.S. 1967; *professor, Family Dentistry, 1963 (1977)*

Zagel, Milton, M.A. Iowa 1936, Ph.D. 1950; *associate professor emeritus, German, 1946 (1978)*

Zavala, Donald C., B.A. Wooster 1944, M.D. Cincinnati 1948; *professor, Internal Medicine, 1969 (1976)*

Zebrowski, Patricia M., B.S. State University of New York (Geneseo) 1977, M.S. Syracuse 1981, Ph.D. 1987; *assistant professor, Speech Pathology and Audiology, 1988*

Zecher, J. Richard, B.A. Ohio State 1963, M.A. Delaware 1965, Ph.D. Ohio State 1969; *adjunct professor, Economics, 1978*

Zeitler, Deborah P., B.A. Iowa 1974, D.D.S. 1978, M.S. 1982; *associate professor, Oral and Maxillofacial Surgery, 1983 (1988)*

Zenor, M. Dean, B.A. Iowa 1946, M.A. 1947, Ph.D. 1949; *professor emeritus, Continuing Education, 1949 (1985)*

Ziegler, Ekhard E., M.D. Innsbruck (Austria) 1964; *professor, Pediatrics, 1973 (1981)*

Zike, Wilbur L., A.B. Houghton 1953, M.D.C.M. McGill (Canada) 1957; *associate professor, Surgery, 1969 (1975)*

Zima, William J., B.A. Carthage 1947, M.A. Iowa 1948; *associate professor, School of Journalism and Mass Communication, 1954 (1973)*

Zimba, Lynn D., A.B. Muhlenberg 1981, Ph.D. Dartmouth 1988; *assistant professor, Psychology, 1988*

Zimmerman, Dale B.S. Iowa State 1980, M.S. Minnesota 1982, Ph.D. Iowa State 1986; *assistant professor, Statistics and Actuarial Science, 1986*

Zimmermann, Gerald N., B.A. Brown 1968, M.S. Southern Illinois 1971, Ph.D. Iowa 1973; *adjunct associate professor, Speech Pathology and Audiology, 1977 (1982)*

Ziolek, Eric E., B.M. Eastman School of Music 1973, Ph.D. Iowa 1982; *assistant professor, School of Music, 1982*

Ziska, James H., B.S. College of St. Thomas 1963, M.D. Iowa 1967; *clinical assistant professor, Pediatrics, 1976*

Zivkovich, Veljko K., M.D. Belgrade (Yugoslavia) 1962; *clinical associate professor, Pediatrics, 1973 (1989)*

Zlatnik, Frank J., B.A. Carleton 1962, M.D. Cornell 1966; *professor, Obstetrics and Gynecology, 1975 (1984)*

Zoeller, Guenter, M.A. Bonn (Germany) 1979, Dr. phil. 1982; *assistant professor, Philosophy, 1986 (1987)*

Zuber, Ernest V., Jr., B.B.A. Iowa 1961, M.A. 1964, Ph.D. 1966; *assistant professor emeritus, Finance, 1961 (1987)*

Zurawski, Douglas J., Pharm.D. Michigan (Ann Arbor) 1987; *adjunct assistant professor, Pharmacy, 1989*

Zurbriggen, Thomas L., B.S. Iowa State 1974, M.D. Iowa 1978; *clinical instructor, Internal Medicine, 1988*

Zurmuehlen, Marilyn, B.S. Ball State 1955, M.A. Haystack Mountain School of Crafts 1963, Ed.D. Pennsylvania State 1970; *professor, School of Art and Art History/Curriculum and Instruction, 1974 (1982)*

Zweng, Marilyn J., B.S. Michigan State 1953, M.S. Wisconsin 1957, Ph.D. 1963; *professor, Curriculum and Instruction/Mathematics, 1965 (1972)*

Iowa Administrative Code: Board of Regents

The following is extracted from the Board of Regents section of the Iowa Administrative Code as of May 1, 1988.

Admission Rules Common to the Three State Universities

681—1.1(262) Admission of undergraduate students directly from high school

Students desiring admission must meet the requirements in this section and also any special requirements for the curriculum, school, or college of their choice.

Applicants must submit a formal application for admission, together with a $10 application fee, and have their secondary school provide a transcript of their academic record, including credits and grades, rank in class, and certification of graduation. Applicants must also submit scores from the American College Test (ACT) or the Scholastic Aptitude Test (SAT), or the equivalent, as determined by each university. The Test of English as a Foreign Language (TOEFL) is required of foreign students whose first language is not English. Applicants may be required to submit additional information or data to support their applications.

1.1(1) Graduates of approved Iowa high schools who have the subject matter background as recommended by each university and who rank in the upper one-half of their graduating class will be admitted. Applicants who are not in the upper one-half of their graduating class may, after a review of their academic and test records, and at the discretion of the admissions officers:

a. Be admitted unconditionally,

b. Be admitted conditionally,

c. Be required to enroll for a tryout period during a preceding summer session, or

d. Be denied admission.

1.1(2) Graduates of accredited high schools in other states may be held to higher academic standards, but must meet at least the same requirements as graduates of Iowa high schools. The options for conditional admission or summer tryout enrollment may not necessarily be offered to these students.

1.1(3) Applicants who are graduates of nonapproved high schools will be considered for admission in a manner similar to applicants from approved high schools, but additional emphasis will be given to scores obtained on standardized examinations.

1.1(4) Applicants who are not high school graduates, but whose classes have graduated, may be considered for admission. They will be required to submit all academic data to the extent that it exists and achieve scores on standardized examinations which will demonstrate that they are adequately prepared for academic study.

Students with superior academic records may be admitted, on an individual basis, for part-time university study while enrolled in high school or during the summers prior to high school graduation.

In rare situations, exceptional students may be admitted as full-time students to a regent university before completing high school. Early admission to a regent university is provided to serve persons whose academic achievement and personal and intellectual maturity clearly suggest readiness for collegiate level study. Each university will specify requirements and conditions for early admission.

681—1.2(262) Admission of undergraduate students by transfer from other colleges

Students desiring admission must meet the requirements in this section and also any special requirements for the curriculum, school, or college of their choice.

Applicants must submit a formal application for admission, together with a $10 application fee, and request that each college they have attended send an official transcript of record to the admissions office. High school academic records and standardized test results may also be required. The Test of English as a Foreign Language (TOEFL) is required of foreign students whose first language is not English.

1.2(1) Transfer applicants with a minimum of 24 semester hours of graded credit from regionally accredited colleges or universities, who have achieved for all college work previously attempted the grade point required by each university for specific programs, will be admitted. Higher academic standards may be required of students who are not residents of Iowa.

Applicants who have not maintained the grade point required by each university for specific programs or who are under academic suspension from the last college attended may, after a review of their academic and test records, and at the discretion of the admissions officers:

a. Be admitted unconditionally,

b. Be admitted conditionally,

c. Be required to enroll for a tryout period during a preceding summer session, or

d. Be denied admission.

1.2(2) Admission of students with fewer than 24 semester hours of college credit will be based on high school academic and standardized test records in addition to review of the college record.

1.2(3) Transfer applicants under disciplinary suspension will not be considered for admission until information concerning the reason for the suspension has been received from the college assigning the suspension. Applicants granted admission under these circumstances will be admitted on probation.

1.2(4) Transfer applicants from colleges and universities not regionally accredited will be considered for admission on an individual basis taking into account all available academic information.

681—1.3(262) Transfer credit practices

The regent universities endorse the Joint Statement on Transfer and Award of Academic Credit approved in 1978 by the American Council on Education (ACE), the American Association of Collegiate Registrars and Admissions Officers (AACRAO), and the Council on Postsecondary Accreditation (COPA). The current issue of Transfer Credit Practices of Selected Educational Institutions, published by the American Association of Collegiate Registrars and Admissions Officers (AACRAO), and publications of the Council on Postsecondary Accreditation (COPA) are examples of references used by the universities in determining transfer credit. The acceptance and use of transfer credit is subject to limitations in accordance with the educational policies operative at each university.

1.3(1) Students from regionally accredited colleges and universities

Credit earned at regionally accredited colleges and universities is acceptable for transfer except that credit in courses determined by the receiving university to be of a remedial, vocational, or technical nature, or credit in courses or programs in which the institution granting the credit is not directly involved, may not be accepted, or may be accepted to a limited extent.

Transfer credit from a two-year college will not reduce the minimum number of credit hours required for a baccalaureate degree if that credit is earned after the total number of credit hours accumulated by the student at all institutions attended exceeds one half of the number of credit hours required for that degree.

1.3(2) Students from colleges and universities which have candidate status

Credit earned at colleges and universities which have become candidates for accreditation by a regional association is acceptable for transfer in a manner similar to that from regionally accredited colleges and universities if the credit is applicable to the bachelor's degree at the receiving university.

Credit earned at the junior and senior classification from an accredited two-year college which has received approval by a regional accrediting association for change to a four-year college may be accepted by a regent university.

1.3(3) Students from colleges and universities not regionally accredited

When students are admitted from colleges and universities not regionally accredited, they may validate portions or all of their transfer credit by satisfactory academic study in residence, or by examination. Each university will specify the amount of the transfer credit and the terms of the validation process at the time of admission.

In determining the acceptability of transfer credit from private colleges in Iowa which do not have regional accreditation, the regent committee on educational relations, upon request from the institutions, evaluates the nature and standards of the academic program, faculty, student records, library, and laboratories.

In determining the acceptability of transfer credit from colleges in states other than Iowa which are not regionally accredited, acceptance practices indicated in the current issue of Transfer Credit Practices of Selected Educational Institutions will be used as a guide. For institutions not listed in the publication, guidance is requested from the designated reporting institution of the appropriate state.

1.3(4) Students from foreign colleges and universities

Transfer credit from foreign educational institutions may be granted after a determination of the type of institution involved and after an evaluation of the content, level, and comparability of the study to courses and programs at the receiving university. Credit may be granted in specific courses, but is frequently assigned to general areas of study. Extensive use is made of professional journals and references which describe the education systems and programs of individual countries.

Residence

681—1.4(262) Classification of residents and nonresidents for admission, tuition, and fee purposes

1.4(1) General

a. A person enrolling at one of the three state universities shall be classified as a resident or nonresident for admission, tuition, and fee purposes by the registrar or someone designated by the registrar. The decision shall be based upon information furnished by the student and other relevant information.

b. In determining resident or nonresident classification, the issue is essentially one of why the person is in the state of Iowa. If the person is in the state primarily for educational purposes, that person will be considered a nonresident. For example, it may be possible that an individual could qualify as a resident of Iowa for such purposes as voting, or holding an Iowa driver's license, and not meet the residency requirements as established by the board of regents for admission, tuition, and fee purposes.

c. The registrar, or designated person, is authorized to require written documents, affidavits, verifications, or other evidence deemed necessary to determine why a student is in Iowa. The burden of establishing that a student is in Iowa for other than educational purposes is upon the student.

A student may be required to file any or all of the following:

(1) A statement from the student describing employment and expected sources of support;
(2) A statement from the student's employer;
(3) A statement from the student's parents verifying nonsupport and the fact that the student was not listed as a dependent on tax returns for the past year and will not be so listed in future years;
(4) Supporting statements from persons who might be familiar with the family situation;
(5) Iowa state income tax return.

d. Change of classification from nonresident to resident will not be made retroactive beyond the term in which application for resident classification is made.

e. A student who gives incorrect or misleading information to evade payment of nonresident fees shall be subject to serious disciplinary action and must also pay the nonresident fees for each term previously attended.

f. Review Committee. These regulations shall be administered by the registrar or someone designated by the registrar. The decision of the registrar or designated person may be appealed to a university review committee. The finding of the review committee may be appealed to the state board of regents.

1.4(2) Guidelines

The following guidelines are used in determining the resident classification of a student for admission, tuition, and fee purposes:

a. A financially dependent student whose parents move from Iowa after the student is enrolled remains a resident provided the student maintains continuous enrollment. A financially dependent student whose parents move from Iowa during the senior year of high school will be considered a resident provided the student has not established domicile in another state.

b. In deciding why a person is in the state of Iowa, the person's domicile will be considered. A person who comes to Iowa from another state and enrolls in any institution of postsecondary education for a full program or substantially a full program shall be presumed to have come to Iowa primarily for educational reasons rather than to establish a domicile in Iowa.

c. A student who was a former resident of Iowa may continue to be considered a resident provided absence from the state was for a period of less than 12 months and provided domicile is reestablished. If the absence from the state is for a period exceeding 12 months, a student may be considered a resident if evidence can be presented showing that the student has long-term ties to Iowa and reestablishes an Iowa domicile.

A person or the dependent of a person whose domicile is permanently established in Iowa, who has been classified as a resident for admission, tuition, and fee purposes, may continue to be classified as a resident so long as domicile is maintained, even though circumstances may require extended absence of the person from the state. It is required that a person who claims Iowa domicile while living in another state or country will provide proof of the continual Iowa domicile as evidence that the person:

(1) Has not acquired a domicile in another state,
(2) Has maintained a continuous voting record in Iowa, and
(3) Has filed regular Iowa resident income tax returns during absence from the state.

d. A student who moves to Iowa may be eligible for resident classification at the next registration following 12 consecutive months in the state provided the student is not enrolled as more than a half-time student (6 credits for an undergraduate or professional student, 5 credits for a graduate student) in any academic year term, is not enrolled for more than 4 credits in a summer term for any classification, and provides sufficient evidence of the establishment of an Iowa domicile.

e. A student who has been a continuous student and whose parents move to Iowa may become a resident at the beginning of the next term provided the student is dependent upon the parents for a majority of financial assistance.

f. A person who is moved into the state as the result of military or civil orders from the government for other than educational purposes, or the dependent of such a person, is entitled to resident status. However, if the arrival of the person under orders is subsequent to the beginning of the term in which the student is first enrolled, nonresident fees will be charged

in all cases until the beginning of the next term in which the student is enrolled. Legislation, effective July 1, 1977, requires that military personnel who claim residency in Iowa (home of record) will be required to file Iowa resident income tax returns.

g. A person who has been certified as a refugee or granted asylum by the appropriate agency of the United States who enrolls as a student at a university governed by the Iowa state board of regents may be accorded immediate resident status for admission, tuition, and fee purposes where the person:

(1) Comes directly to the state of Iowa from a refugee facility or port of debarkation; or
(2) Comes to the state of Iowa within a reasonable time and has not established domicile in another state.

Any refugee or individual granted asylum not meeting these standards will be presumed to be a nonresident for admission, tuition, and fee purposes and thus subject to the usual method of proof of establishment of Iowa residency.

h. An alien who has immigrant status establishes Iowa residency in the same manner as a United States citizen.

1.4(3) Facts

a. The following circumstances, although not necessarily conclusive, have probative value in support of a claim for resident classification:

(1) Reside in Iowa for 12 consecutive months, and be primarily engaged in activities other than those of a full-time student, immediately prior to the beginning of the term for which resident classification is sought.
(2) Reliance upon Iowa resources for financial support.
(3) Domicile in Iowa of persons legally responsible for the student.
(4) Former domicile in the state and maintenance of significant connections therein while absent.
(5) Acceptance of an offer of permanent employment in Iowa.
(6) Other facts indicating the student's domicile will be considered by the universities in classifying the student.

b. The following circumstances, standing alone, do not constitute sufficient evidence of domicile to effect classification of a student as a resident under these regulations:

(1) Voting or registration for voting.
(2) Employment in any position normally filled by a student.
(3) The lease of living quarters.
(4) Admission to a licensed practicing profession in Iowa.
(5) Automobile registration.
(6) Public records, for example, birth and marriage records, Iowa driver's license.
(7) Continuous presence in Iowa during periods when not enrolled in school.
(8) Ownership of property in Iowa, or the payment of Iowa taxes.

681—1.5(262) Registration and transcripts—general

A person may not be permitted to register for a course or courses at a state board of regents institution until any delinquent accounts owed by the person to an institution or any affiliated organization for which an institution acts as fiscal agent have been paid.

A state board of regents institution may withhold official transcripts of the academic record of a person until any delinquent accounts owed by the person to an institution or any affiliated organization for which an institution acts as fiscal agent have been paid.

Supplemental Specific Rules for The University of Iowa

681—2.1(262) Formal application for admission

All applicants for admission to any college of the University of Iowa must submit a formal application for admission with the required official transcripts and other supporting material as required to the director of admissions. Students may not be registered until they have been issued an admission statement by the director of admissions.

681—2.3(262) College of Business Administration

2.3(1) Application for admission

Applications for admission to the college of business administration should be submitted to the director of admissions.

Applicants are urged to apply as early as possible, since this will give the admissions committee more time to devote to each application. Closing dates for receiving applications will be announced well in advance of the opening date of any session.

2.3(2) Requirements for admission

For admission to the college of business administration an applicant must have—

a. Completed specific course work as prescribed by the faculty of the college.

b. Attained satisfactory scores on the university's required admission examinations.

c. Maintained a satisfactory grade-point average on all courses undertaken, and on all courses undertaken at the University of Iowa, and on all courses undertaken in business and economics.

Applications from students who have minor deficiencies in meeting grade-point requirements specified above will be reviewed by the admissions committee of the college, and upon favorable recommendation of the committee, such students may be granted conditional or probationary admissions.

Fulfillment of the minimal requirements listed above, however, does not assure admission to the college of business administration. From those applicants who meet the minimum requirements, the admissions committee will select the applicants who, in their judgment, appear to be best qualified.

681—2.4(262) College of Dentistry

2.4(1) Application for admission

Address all inquiries regarding admission to the Director of Admissions, University of Iowa.

Applicants are urged to apply as early as possible, since this will give the admissions committee more time to devote to each application. Closing dates for receiving applications will be announced well in advance of the opening date of any session.

Applicants for admission to dentistry are encouraged to complete a program leading to a baccalaureate degree before entering dentistry. Applicants should consider a combined program of liberal arts and dentistry which would qualify them for a baccalaureate degree upon the completion of the freshman year in dentistry. Preference will be given to students who have the baccalaureate degree or who have completed the requirements for the degree in a combined program.

Fulfillment of the specific requirements for admission listed does not ensure admission to the college of dentistry. From the applicants meeting the minimum requirements, the admissions committee will select the applicants who in their judgment appear to be best qualified for the study and practice of dentistry.

Each applicant must place on file in the office of the director of admissions the completed application form and an official transcript from each college attended.

The college work outlined below will suffice to meet the minimal academic requirements for admission to the college of dentistry.

The college curriculum must include at least three academic years of accredited work comprising not less than 96 semester hours and including specific required science courses as prescribed by the faculty of the college. Electives should be chosen so as to give the applicant a well-rounded educational background.

In order to meet minimum scholarship requirements, the applicant should attain a cumulative grade-point average of 2.50. Since the quality of course work in predental science is basic to success in dentistry, special consideration to such college work is given by the admissions committee. The grade-point average is based upon the University of Iowa's marking system in which a grade of A is equivalent to four points. Other marking systems will be evaluated by the office of admissions and the committee on admissions of the college of dentistry.

Applicants who have completed the requirements for admission to dentistry five or more years prior to seeking admission to this college of dentistry will be considered by the admissions committee only under exceptional conditions.

Preference will be given to applicants who are residents of Iowa, but consideration will also be given to outstanding nonresidents.

Personal interviews will be required of applicants for admission to the college of dentistry. Applicants will be notified when they should appear for the required interviews with members of the admissions committee.

All applicants must complete the dental aptitude tests sponsored by the council on dental education of the American Dental Association. Tests are given three times annually. The University of Iowa is a testing center.

To facilitate early selection, applicants for admission to the college of dentistry are urged to complete the aptitude test no later than October to enable the admissions committee to begin its selection in December.

Accepted applicants are required to make the required deposit within two weeks after notification of favorable action on their applications. This deposit is not refundable but is credited toward the first fee payment. The applicant who fails to make the deposit within the time specified forfeits a place in the entering class.

Applicants accepted for admission are required to submit a satisfactory physical examination report to the university student health service within two weeks following notification of acceptance.

All applicants must also complete, through student health service, an X-ray film of the chest and a successful vaccination against smallpox prior to registration.

2.4(2) Advanced standing

Applications for admission with advanced standing are handled as individual cases.

681—2.5(262) College of Engineering

Address all inquiries regarding admission to the Director of Admissions, University of Iowa, Iowa City, Iowa.

Closing dates for receiving applications will be announced well in advance of the opening date of any session.

2.5(1) Admission of freshman students

The applicant must submit a formal application for admission and must have the secondary school provide a certificate of high school credits, including a complete statement of the applicant's high school record, rank in class, scores on standardized tests, and certification of high school graduation. The applicant must also submit any other evidence such as a certificate of health that may be required by this university.

Each applicant must have attained satisfactory scores on the university's required admission examinations, maintained a satisfactory cumulative grade-point average, achieved satisfactory rank in graduating class, and successfully completed all prerequisite courses. The university with the approval of the state board of regents shall establish and periodically review specific minimum requirements for admission to the college of engineering. Among the items to be so determined are test score, grade-point average, class rank and prerequisite courses. These specific determinations will be published in the university catalog.

From applicants who do not meet minimum admission requirements, the director of admissions may after a review of the applicant's record: (a) Admit unconditionally, (b) admit on probation, (c) require enrollment for a tryout period during a preceding summer session, or (d) deny admission.

2.5(2) Admission of undergraduate students by transfer

The applicant must submit a formal application and official transcript of college work. Each applicant should have:

a. Maintained satisfactory progress in mathematics.

b. Attained satisfactory scores on the university's required admission examinations.

c. Maintained a satisfactory cumulative grade-point average on all college work undertaken.

From applicants who do not meet recommended requirements, the director of admissions will review individual records and may offer probationary admission.

681—2.6(262) Graduate College

Graduates of any college or university accredited by regional accrediting associations may if the academic record is satisfactory be admitted to the graduate college. Admission to the graduate college is not the equivalent of acceptance as a candidate for an advanced degree. Such acceptance is given usually after the completion in residence of work at the university and upon recommendation of the major department and approval by the dean of the graduate college. The acceptance of a student as a degree candidate is determined upon the merits of each individual case.

A student who is within four semester hours of having satisfied all the requirements for the bachelor's degree at the University of Iowa may be given a tentative admission to the graduate college.

681—2.7(262) College of Law

2.7(1) Application for admission

Address all inquiries concerning admission to the Director of Admissions, University of Iowa, Iowa City, Iowa. Beginning students may enter the college of law only in the summer session or the fall semester. Closing dates for receiving applications will be announced well in advance of the opening date of any session.

To be considered for admission, an applicant should have attained a cumulative grade-point average of at least 2.3 on all college work undertaken. The grade-point average is based upon the University of Iowa's marking system in which a grade of A is equivalent to four points. Other marking systems will be evaluated by the office of admissions.

Applicants for admission must present a baccalaureate degree from an approved college or university prior to commencing work in the college of law.

Each applicant for admission must take the Law School Admission Test administered by the Educational Testing Service, Princeton, New Jersey, and have his score forwarded to the college of law. The test is given several times per year and may be taken at numerous locations in the United States and throughout the world. Applicants are urged to take the test in the fall or winter preceding the fall semester for which they are making application. Except upon a showing acceptable to it, the admissions committee will not consider applications from students who fail to take the test prior to the June 1 preceding the fall semester in which they wish to enter.

Fulfillment of the specific requirements for admission listed above does not ensure admission to the college of law. From the applicants meeting the minimum requirements, the admissions committee of the college of law will select those applicants who, in their judgment, appear to be best qualified for the study and practice of law. The law admissions committee may require personal interviews of applicants.

2.7(2) Admission with advanced standing

A transfer student may be eligible for admission if the student (a) has attended a school approved by the Association of American Law Schools; (b) is in good standing at the time of withdrawal (evidenced by a letter from the dean of the school from which transferring); (c) meets the admission requirements for beginning students; and (d) has done substantially above average work in the law school the student attended. Where an applicant has completed more than one year of law study, advanced standing will be permitted only in exceptional cases. Applicants for admission with advanced standing should comply with the procedures required for admission to the first-year class.

681—2.8(262) College of Medicine

2.8(1) Application for admission

Address all inquiries regarding admission to the Director of Admissions, University of Iowa.

Applicants are urged to apply as early as possible, since this will give the admissions committee more time to devote to each application. Closing dates for receiving applications will be announced well in advance of the opening date of any session.

Fulfillment of the specific requirements for admission listed below does not ensure admission to the college of medicine. From the applicants meeting the specific requirements, the admissions committee of the college of medicine will select those applicants who in their judgment appear to be best qualified for the study and practice of medicine.

Prior to entrance an applicant must:

a. Have received the baccalaureate degree; or

b. Have completed three years of a combined baccalaureate-medicine curriculum which qualifies the applicant to receive the baccalaureate degree on completion of the first year in medicine; or

c. Have completed three years of a baccalaureate program which includes the general graduation requirements of the college of liberal arts of the University of Iowa for the combined baccalaureate degree.

Each applicant must place on file in the office of the director of admissions the completed application form and an official transcript from each college attended.

The college work as outlined below will suffice to meet the minimal academic requirements for admission to the college of medicine.

Applicants who have completed the baccalaureate degree and required courses five or more years prior to seeking admission to this college of medicine will be considered by the admissions committee only under exceptional conditions.

The college curriculum must include at least three years (equivalent to 96 semester hours) including specific required science courses as prescribed by the faculty of the college.

Students planning to study medicine should bear in mind that other college work is required in addition to prerequisite sciences because it offers an opportunity to secure a well-rounded education, which is of special importance to those entering the medical profession. In the selection of applicants, preference will be given to those who give evidence of having obtained such a broad education.

To be considered for admission, an applicant must have attained a grade-point average of at least 2.5 for all college work undertaken. As the quality of work in premedical science is very basic to success in medicine, special attention will be given by the admissions committee to grades in science. The grade-point average is based upon the University of Iowa's marking system in which a grade of A is equivalent to four points. Other marking systems will be evaluated by the office of admissions and the committee on admissions of the college of medicine.

Preference will be given to applicants with high scholastic standing who are residents of Iowa, and consideration will also be given to outstanding nonresidents. Applicants for admission are required to take the medical college admissions test which is administered for the Association of American Medical Colleges. Applicants are requested to complete this test in May or October of the year preceding that for which they are applying for admission. Students may make arrangements to apply for this examination through the university examination service, the University of Iowa.

Personal interviews will be required. Applicants will be contacted for the appointment for required interviews.

Applicants accepted for admission are required to submit a satisfactory physical examination report to the university student health service within two weeks following notification of acceptance.

All applicants must also complete, through student health service, an X-ray film of the chest and successful vaccination against smallpox prior to registration.

2.8(2) Admission to advanced standing

If their work preparatory to entering a college of medicine would have met entrance requirements of this college, students from other approved medical colleges may be admitted to advanced standing according to the following conditions:

Only applicants of high scholastic standing will be considered.

They must present certificates showing that they have satisfactorily completed courses equivalent to those already pursued by the class they wish to enter.

The committee on admission to advanced standing will decide in each case whether examinations in the various subjects will be required.

Applications will be considered only upon receipt of a statement from the dean or registrar of the college from which the applicant comes, showing the actual amount of time the student has spent in the study of medicine, the courses taken, and the grades received, together with a statement of the work preparatory to entering upon the course in medicine.

No advanced standing will be granted to students from other than approved medical schools. Students may be granted subject credit upon recommendation of the head of the department concerned, for work taken in other than medical schools.

2.8(3) Unclassified students

Applicants for admission to the college of medicine who are not candidates for a degree but who desire to register for special subjects, will be admitted to any lecture or laboratory course only upon complying with all the regular requirements for admission to such course or by action of the faculty upon recommendation of the professor in charge of the course.

681—2.9(262) College of Nursing

Applications for admission to the college of nursing should be submitted to the Director of Admissions, The University of Iowa, Iowa City, Iowa. Applicants for admission to the undergraduate program in nursing must present a minimum of 30 semester hours completed in an accredited college. For admission to the college of nursing an applicant must have:

1. Completed specific course work as prescribed by the faculty of the college. The director of admissions will provide a list of the course work required.

2. Completed the American College Tests.

3. Performed satisfactorily on all courses undertaken.

Applications from students who have minor deficiencies in meeting grade-point requirements specified above will be reviewed by the admissions committee of the college, and, upon favorable recommendation of the committee, such students may be granted conditional or probationary admissions.

Fulfillment of the minimum requirements listed above, however, does not assure admission to the college of nursing. From those applicants who meet the minimum requirements, the admissions committee will select the applicants who, in their judgment, appear to be best qualified.

681—2.10(262) College of Pharmacy

2.10(1) General basis for admission

Fulfillment of the specific requirements for admission does not ensure admission to the college of pharmacy. From the applicants meeting the specific requirements, the admissions committee will select those applicants who in their judgment appear to be best qualified. Applicants for admission to pharmacy should have graduated from an approved high school or have an equivalent amount of training.

2.10(2) College work

The college work as outlined below will meet the minimum academic requirements for admission to the college of pharmacy. The minimum should include 32 semester hours of college level work exclusive of credit in military and air science and physical education. The 32 semester hours must include:

Communication skills. Applicants must have demonstrated satisfactory achievement in communication skills according to the requirements of the college of liberal arts at the state University of Iowa. Applicants from other institutions may meet this requirement by presenting six semester hours of credit in English composition and rhetoric and two semester hours of credit

in speech or an eight-semester-hour year course in communication skills.

Inorganic chemistry and qualitative analysis, eight semester hours.

College mathematics, eight semester hours.

Physics or zoology, eight semester hours.

Students from other institutions may substitute a comparable eight-semester-hour course in biology in lieu of zoology.

Military or air science (if available), zero to two semester hours.

Students who present minor deficiencies in meeting the above requirements may be admitted to the college of pharmacy upon the recommendation of the dean of admissions and the college of pharmacy.

2.10(3) Scholarship and application deadline

To be considered for admission to the college of pharmacy, students must have earned a 2.00 or C average on all collegiate work undertaken. The minimum grade-point average of 2.00 is based on the state University of Iowa's marking system in which the grade of A is equivalent to four points. Applications for admission and the required official transcripts should be filed before March 1 for the class to enter pharmacy in September.

2.10(4) Required tests

Applicants for admission are required to take the American College Testing Program test.

2.10(5) Current requirements

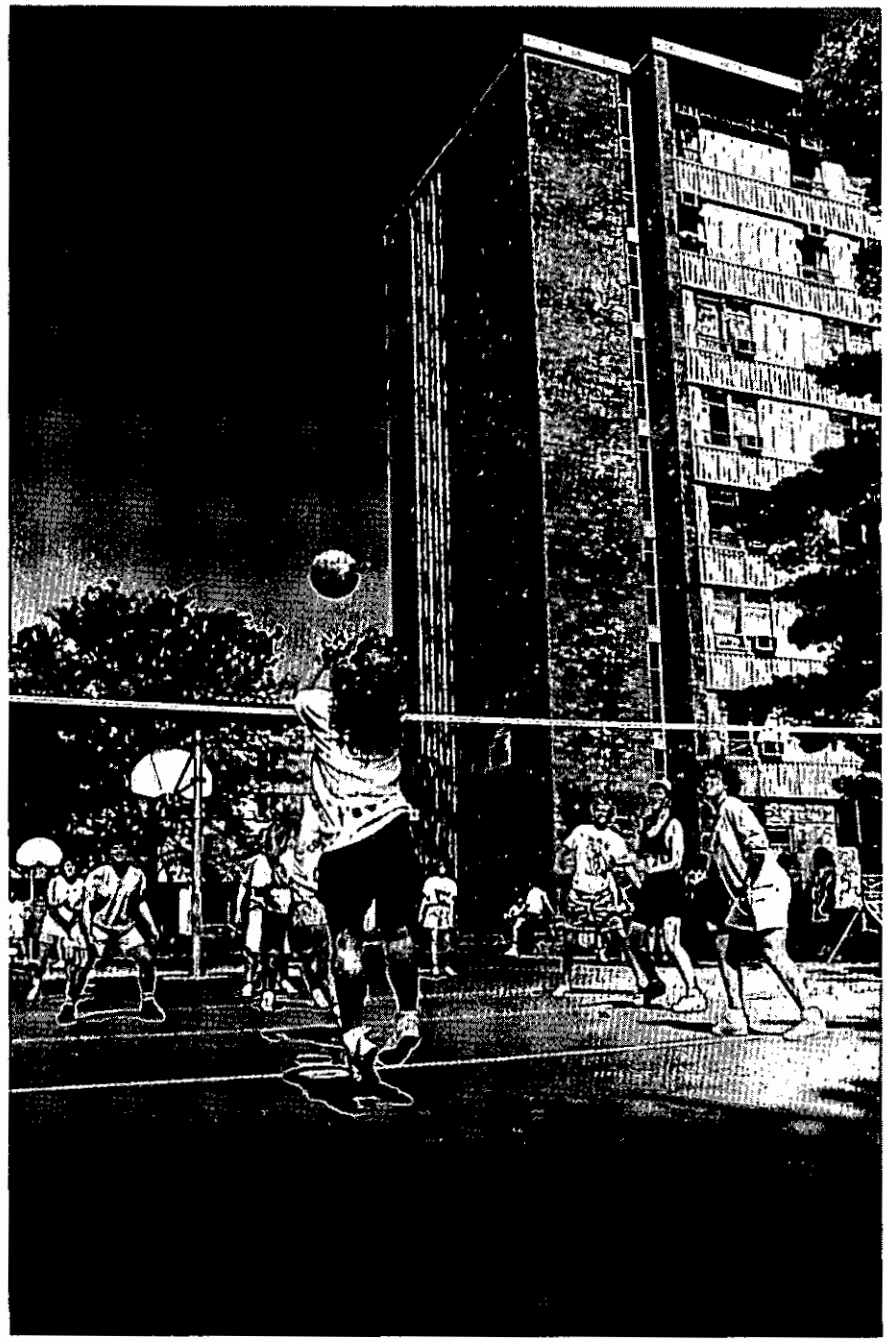
Applicants who have completed work in a college of pharmacy accredited by the American Council on Pharmaceutical Education may if their college academic average is acceptable be admitted and granted advanced standing toward the degree of bachelor of science in pharmacy.

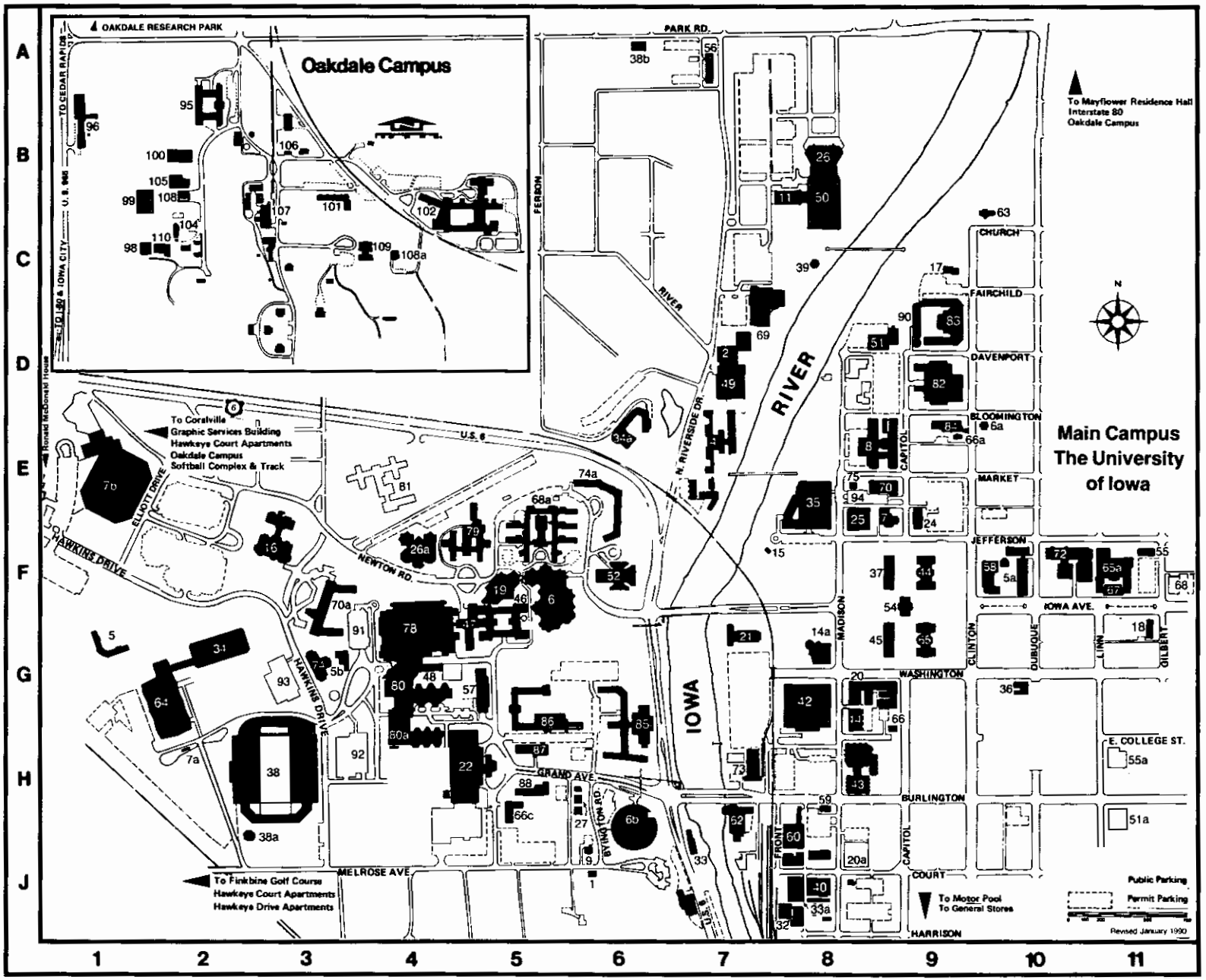
681—2.11(262) College of Liberal Arts

Applicants for admission to liberal arts must meet the rules that are common to the three state institutions in Iowa as listed in 1.1(262), 1.2(262) and 1.3(262).

681—2.12(262) College of Education

Students at the university desiring professional work in education are registered in the college of liberal arts or the graduate college. Requirements for permission to take teacher-training courses are listed in the university catalog.




Oakdale Campus
OAKDALE RESEARCH PARK
TO CEDAR RAPIDS
TO IOWA CITY
U.S. 6
Ronald McDonald House
PARK RD.
FERSON
RIVER
N. RIVERSIDE DR.
To Mayflower Residence Hall
Interstate 80
Oakdale Campus
Main Campus
The University
of Iowa
N
CHURCH
FAIRCHILD
DAVENPORT
BLOOMINGTON
MARKET
JEFFERSON
IOWA AVE.
E. COLLEGE ST.
WASHINGTON
BURLINGTON
CAPITOL
COURT
HARRISON
MADISON
CLINTON
DUBUQUE
LINN
GILBERT
FRONT
CAPITOL
To Coralville
Graphic Services Building
Hawkeye Court Apartments
Oakdale Campus
Softball Complex & Track
U.S. 6
ELLIOTT DRIVE
HAWKINS DRIVE
NEWTON RD.
GRAND AVE.
MELROSE AVE
To Finkbine Golf Course
Hawkeye Court Apartments
Hawkeye Drive Apartments
To Motor Pool
To General Stores
Public Parking
Permit Parking
Revised January 1990
A
B
C
D
E
F
G
H
J
1
2
3
4
5
6
7
8
9
10
11

Index to Campus Map

MAIN CAMPUS

BUILDINGS

1 Afro-American Cultural Center (J-6)
2 Alumni Center (D-7)
4 Art Building (E-7)
5 Baseball Stadium (G-1)
5a Biology Building (F-10)
5b Botany Plant House (G-3)
6 Bowen Science Building (F-5)
6a Bowman House (D-10)
6b Boyd Law Building (H-6)
7 Calvin Hall (F-9)
7a Cambus Offices (H-2)
7b Carver-Hawkeye Arena (E-1)
8 Chemistry-Botany Building (E-9)
9 Chicano/Indian American Cultural Center (J-6)
11 Clapp Recital Hall (B-8)
14 Communications Center (G-8)
14a Communication Studies Building (G-8)
15 Danforth Chapel (F-7)
16 Dental Science Building (F-3)
17 Dey House (C-9)
18 Eastlawn (G-11)
19 John W. Eckstein Medical Research Building (G-5)
20 Engineering Building (G-8)
20a Engineering Research Facility (J-8)
21 English-Philosophy Building (G-7)
22 Field House (H-4)
General Stores (directions J-9)
24 Gilmore Hall (F-9)
Graphic Services Building (directions E-2)
25 Halsey Hall (F-8)
26 Hancher Auditorium (B-8)
26a Hardin Library for the Health Sciences (F-4)
Hawkeye Court Apartments (directions E-2)
Hawkeye Drive Apartments (directions J-2)
27 Health Protection Office (H-6)
32 Hydraulics East Annex (J-8)
33 Hydraulics Laboratory (J-7)
33a Hydraulics Model Annex (J-8)
33b Hydraulics Lab Wind Tunnel Annex (J-8)
34 Indoor Practice Facility (G-2)
34a International Center (E-6)
35 Iowa Memorial Union (F-8)
36 Jefferson Building (G-10)
37 Jessup Hall (F-9)
38 Kinnick Stadium (H-3)
38a Klotz Tennis Center (H-2)
38b Kuhl House (A-6)
39 Lagoon Shelter House (C-8)
40 Laundry Building (J-8)
42 Library, Main (G-8)
43 Lindquist Center (H-8)
44 Macbride Hall (F-9)
45 MacLean Hall (G-9)
46 Medical Laboratories (G-5)
47 Medical Research Center (G-5)
48 Medical Research Facilities (G-4)
Motor Pool (directions J-9)
49 Museum of Art (D-7)
50 Music Building (B-8)
51 North Hall (D-9)
51a Northwestern Bell Building (H-11)
52 Nursing Building (F-6)
54 Old Capitol (F-9)
55 Old Music Building (F-11)
55a Old Public Library (H-11)
56 Parklawn Apartments (A-7)
57 Pharmacy Building (G-5)
58 Phillips Hall (F-10)
59 Physical Plant Offices (H-8)
60 Physical Plant Shops (J-8)
62 Power Plant (H-7)
63 President's Residence (B-10)
64 Recreation Building (G-2)
64a Ronald McDonald House (E-1)
65 Schaeffer Hall (G-9)
65a Seashore Hall (F-11)
66 Security Building, 131 S. Capitol (H-9)
66a Shambaugh House Honors Center (D-9)
66b Softball Complex and Track (directions E-2)
66c South Quadrangle (H-5)
67 Spence Laboratories of Psychology (F-11)
68 State Historical Society (F-11)
68a Steindler Building (F-5)
69 Theatre Building (D-7)
70 Trowbridge Hall (E-9)
70a University Hospital School (F-3)
72 Van Allen Hall (F-10)
73 Water Treatment Plant (H-7)
74 Wendell Johnson Speech and Hearing Center (G-3)
74a Westlawn (E-6)
75 Women's Resource and Action Center (E-8)

HOSPITALS

78 General Hospital (G-4)
79 Psychiatric Hospital (F-5)
80 Roy J. Carver Pavilion (G-4)
80a John W. Colloton Pavilion (G-4)
80b John Pappajohn Pavilion (H-4)
81 Veterans Affairs Medical Center (E-4)

RESIDENCE HALLS

82 Burge (D-9)
83 Currier (D-9)
84 Daum (D-9)
85 Hillcrest (H-6)
85a Mayflower (directions A-11)
86 Quadrangle (G-5)
87 Rienow (H-5)
88 Slater (H-5)
90 Stanley (D-9)

PUBLIC PARKING RAMPS

91 Hospital Parking Ramp No. 1 (G-3)
92 Hospital Parking Ramp No. 2 (H-3)
93 Hospital Parking Ramp No. 3 (G-3)
94 Iowa Memorial Union Parking Ramp (E-8)
94a North Campus Parking Ramp (D-9)

OAKDALE CAMPUS

95 Agricultural Medicine Research Facility (B-2)
96 Animal Quarters (B-1)
98 Helicopter Hangar (C-2)
99 Hydraulics Research Lab (B-1)
100 Iowa Geological Survey (B-2)
101 Oakdale Apartments (B-3)
102 Oakdale Hall (C-4)
104 Pediatric Research (C-2)
105 Physiology Research Building (B-2)
106 Post Office (B-3)
107 Power Plant (C-2)
108 Research Facilities (B-2)
108a Superintendent's Building (C-4)
109 Technology Innovation Center (C-3)
110 Waste Storage Facility (C-2)

COLLEGES

Business Administration, Phillips Hall (58) (F-10)
Dentistry, Dental Science Building (16) (F-3)
Education, Lindquist Center (43) (H-8)
Engineering, Engineering Building (20) (G-8)
Graduate, Gilmore Hall (24) (F-9)
Law, Boyd Law Building (6b) (H-6)
Liberal Arts, Schaeffer Hall (65) (G-9)
Medicine, John W. Eckstein Medical Research Building (13) (F-5)
Nursing, Nursing Building (52) (F-6)
Pharmacy, Pharmacy Building (57) (G-5)

OTHER MAJOR OFFICES

Academic Affairs, Jessup Hall (37) (F-9)
Admissions Office, Calvin Hall (7) (F-9)
Athletic Ticket Office, Carver-Hawkeye Arena (7a) (E-1)
Business and Liberal Arts Placement Office, Iowa Memorial Union (35) (F-8) and Phillips Hall (58) (F-10)
Business Office, Jessup Hall (37) (F-9)
Campus Information Center, Iowa Memorial Union (35) (F-8)
Campus Stores, Oakdale Hall (C-4)
Continuing Education, International Center (34a) (E-6)
Dental Clinics, Dental Science Building (16) (F-3)
Educational Placement, Lindquist Center (43) (H-8)
Family Practice Clinic, Steindler Building (68a) (F-5)
Financial Aid Office, Calvin Hall (7) (F-9)
Iowa Testing Programs, Lindquist Center (43) (H-8)
Museum of Natural History and Iowa Hall, Macbride Hall (44) (F-9)
Orientation Services, Calvin Hall (7) (F-9)
Parents Association, Old Capitol (54) (F-9)
Parking Office, Iowa Memorial Union Parking Ramp (94) (E-8)
Personnel Services, Eastlawn (19) (G-11)
President's Office, Jessup Hall (37) (F-9)
Printing Department, Graphic Services Building (directions E-2)
Purchasing, Jefferson Building (36) (G-10)
Public Policy Center, South Quadrangle (66c) (H-5)
Regional Child Health Specialty Clinics, University Hospital School (70a) (F-3)
Registrar's Office, Jessup Hall (37) (F-9)
Residence Services, Burge Hall (82) (D-9)
Special Support Services, Calvin Hall (7) (F-9)
State Archaeologist, Eastlawn (19) (G-11)
Student Health Service; Steindler Building (68a) (F-5)
Undergraduate Advising Center, Burge (82) (D-9) and Dey House (17) (C-9)
University Hygienic Laboratory, Oakdale Hall (102) (C-4)
University Relations, Old Capitol (54) (F-9)
Weeg Computing Center, Lindquist Center (43) (H-8)

Index

V

W